

NFPA®

101®

Life Safety Code®

2021



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NFPA 101®

Life Safety Code®

2021 Edition

This edition of NFPA 101®, *Life Safety Code*®, was prepared by the Technical Committees on Assembly Occupancies; Board and Care Facilities; Building Service and Fire Protection Equipment; Detention and Correctional Occupancies; Educational and Day-Care Occupancies; Fire Protection Features; Fundamentals; Health Care Occupancies; Industrial, Storage, and Miscellaneous Occupancies; Interior Finish and Contents; Means of Egress; Mercantile and Business Occupancies; and Residential Occupancies; released by the Correlating Committee on Safety to Life; and acted on by the NFPA membership during the 2020 NFPA Technical Meeting held June 8–29. It was issued by the Standards Council on August 11, 2020, with an effective date of August 31, 2020, and supersedes all previous editions.

This edition of NFPA 101 was approved as an American National Standard on August 31, 2020.

Origin and Development of NFPA 101

The *Life Safety Code* had its origin in the work of the Committee on Safety to Life of the National Fire Protection Association, which was appointed in 1913. In 1912, a pamphlet titled *Exit Drills in Factories, Schools, Department Stores and Theaters* was published following its presentation by the late Committee member R. H. Newbern at the 1911 Annual Meeting of the Association. Although the pamphlet's publication antedated the organization of the committee, it was considered a committee publication.

For the first few years of its existence, the Committee on Safety to Life devoted its attention to a study of the notable fires involving loss of life and to analyzing the causes of this loss of life. This work led to the preparation of standards for the construction of stairways, fire escapes, and other egress routes for fire drills in various occupancies, and for the construction and arrangement of exit facilities for factories, schools, and other occupancies. These reports were adopted by the National Fire Protection Association and published in pamphlet form as *Outside Stairs for Fire Exits* (1916) and *Safeguarding Factory Workers from Fire* (1918). These pamphlets served as a groundwork for the present *Code*. These pamphlets were widely circulated and put into general use.

In 1921, the Committee on Safety to Life was enlarged to include representatives of certain interested groups not previously participating in the standard's development. The committee then began to further develop and integrate previous committee publications to provide a comprehensive guide to exits and related features of life safety from fire in all classes of occupancy. Known as the *Building Exits Code*, various drafts were published, circulated, and discussed over a period of years, and the first edition of the Building Exits Code was published by the National Fire Protection Association in 1927. Thereafter, the committee continued its deliberations, adding new material on features not originally covered and revising various details in the light of fire experience and practical experience in the use of the *Code*. New editions were published in 1929, 1934, 1936, 1938, 1939, 1942, and 1946 to incorporate the amendments adopted by the National Fire Protection Association.

National attention was focused on the importance of adequate exits and related fire safety features after the Cocoanut Grove Nightclub fire in Boston in 1942 in which 492 lives were lost. Public attention to exit matters was further stimulated by the series of hotel fires in 1946 (LaSalle, Chicago — 61 dead; Canfield, Dubuque — 19 dead; and Winecoff, Atlanta — 119 dead). The *Building Exits Code*, thereafter, was used to an increasing extent for regulatory purposes. However, the *Code* was not written in language suitable for adoption into law, because it had been drafted as a reference document and contained advisory provisions that were useful to building designers but inappropriate for legal use. This led to a decision by the committee to re-edit the entire *Code*, limiting the body of the text to requirements suitable for mandatory application and placing advisory and explanatory material in notes. The re-editing expanded *Code* provisions to cover additional occupancies and building features to produce a complete document. The *Code* expansion was carried

on concurrently with development of the 1948, 1949, 1951, and 1952 editions. The results were incorporated into the 1956 edition and further refined in subsequent editions dated 1957, 1958, 1959, 1960, 1961, and 1963.

In 1955, NFPA 101B, on nursing homes, and NFPA 101C, on interior finish, were published. NFPA 101C was revised in 1956. These publications have since been withdrawn.

In 1963, the Committee on Safety to Life was restructured to represent all interested factions and to include only those members with broad knowledge of fire matters. The committee served as a review and correlating committee for seven sectional committees whose personnel included members having a special knowledge and interest in various portions of the *Code*.

Under the revised structure, the sectional committees, through the Committee on Safety to Life, prepared the 1966 edition of the *Code*, which was a complete revision of the 1963 edition. The *Code* title was changed from *Building Exits Code* to *Code for Safety to Life from Fire in Buildings and Structures*. The *Code* text was written in enforceable code language, and all explanatory notes were placed in an appendix.

The *Code* was placed on a 3-year revision schedule, with new editions adopted in 1967, 1970, 1973, and 1976.

In 1977, the Committee on Safety to Life was reorganized as a technical committee, with an executive committee and standing subcommittees responsible for various chapters and sections. The 1981 edition contained major editorial changes, including reorganization within the occupancy chapters, to make them parallel to each other, and the splitting of requirements for new and existing buildings into separate chapters. Chapters on detention and correctional facilities were added, as well as new sections for ambulatory health care centers.

The 1985 edition contained a new Chapter 21 on residential board and care occupancies with related Appendix F and Appendix G, a new Appendix D on alternative calculations for stair width, and Appendix E, a fire safety evaluation system (FSSES) for detention and correctional facilities.

The 1988 edition contained a major change in the method of determining egress capacity with the deletion of the traditional units of exit width and the substitution of a straight linear approach to calculating egress capacity. Appendix C through Appendix G were moved from NFPA 101 into a new document, NFPA 101M.

The 1991 edition contained numerous new requirements for mandatory sprinklers in new health care facilities, hotels, apartment buildings, lodging and room houses, and board and care facilities, as well as mandatory sprinkler requirements for existing high-rise hotels and apartment buildings. The requirements for board and care facilities were split into two chapters, Chapter 22 for new construction and Chapter 23 for existing buildings.

The 1994 edition contained new requirements for accessible means of egress, areas of refuge, and ramps, putting the *Code* in substantial agreement with the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

The 1997 edition relocated the material on day care occupancies from Chapters 10 and 11 for new and existing educational occupancies to new Chapters 30 and 31. The operating features requirements, previously contained in Chapter 31, were interspersed throughout the *Code*, as applicable.

The 2000 edition introduced a performance-based option via Section 4.4 and new Chapter 5. That edition also reformatted the *Code* for substantial compliance with the NFPA *Manual of Style*: (1) former Chapter 1, General, was split into Chapter 1, Administration, and Chapter 4, General; (2) the mandatory references list was moved from Chapter 33 to Chapter 2; (3) all definitions were moved into Chapter 3, and each defined term was numbered; (4) the paragraph numbering style that separated the chapter number from the section number using a hyphen was changed to the use of a decimal point as the separator; and (5) the appendixes were renamed annexes. Former Chapter 32 on special structures and high-rise buildings was moved to Chapter 11 to join the core chapters (i.e., the chapters that are not occupancy specific). The subject of interior finish, contents, and furnishings was moved from Section 6.5 into a separate new chapter, Chapter 10. The occupancy chapters, formerly Chapters 8 through 32, became Chapters 12 through 42, with some repositioning of chapters. For example, the daycare occupancies chapters were renumbered from Chapters 30/31 to Chapters 16/17, so as to be positioned immediately after the chapters for educational occupancies.

The 2003 edition reformatted all exceptions into numbered or lettered paragraphs. Some reformatting of paragraphs with multiple requirements was done for additional compliance with the NFPA *Manual of Style*.

The 2006 edition repositioned the inch-pound (US Customary) units to appear first, followed by the metric equivalent (SI) units in parentheses. New Chapter 43, Building Rehabilitation, was added to promote the adaptive reuse of existing buildings without sacrificing needed life safety.

The 2009 edition added provisions to Chapter 7 for electrically controlled egress doors, horizontal-sliding doors serving an area with an occupant load of fewer than 10, elevator lobby access door locking, and door inspection and maintenance. The remoteness criteria of Chapter 7 were expanded to have applicability to all three portions of the means of egress — exit access, exit, and exit discharge. Extensive revisions were made throughout the *Code* to standardize the use of the terms *stories in height*, *finished ground level*, *grade plane*, *basement*, and *level of exit discharge*. Section 9.6 and the applicable occupancy chapters were

revised to limit the use of public address systems for occupant alarm notification to large venue assembly occupancies and mercantile mall buildings, where the physical configuration, function, and human behavior present challenges with respect to effective occupant notification by standard means in accordance with NFPA 72®, *National Fire Alarm Code*®. A subsection was added to Chapter 11 for special provisions applicable to air traffic control towers. The criteria for assembly stage proscenium opening fire curtains were deleted from Chapter 12 and replaced by a reference to the new fire curtain provisions of NFPA 80, *Standard for Fire Doors and Other Opening Protectives*. Provisions were added to Chapters 14 through 17 for the placement and use of alcohol-based hand-rub dispensers in educational and day-care occupancies. The provisions of Chapters 18 and 19 were expanded to address door locking where the needs of patients or clients require specialized protective measures for their safety and security in hospitals, nursing homes, and limited care facilities. Also, a limitation on common path of travel was added to Chapter 18 for new health care occupancies; the requirement for patient sleeping room windows was deleted for new and existing health care occupancies; and all existing high-rise health care occupancy buildings must be sprinklered within 12 years of the adoption of this edition of the *Code*. Numerous occupancy chapters were revised to require emergency plans in accordance with Section 4.8. Chapter 43 on building rehabilitation was revised to address issues not identified when the chapter was written for the 2003 edition and to delete redundancies. An adoptable annex was added for elevators for occupant evacuation prior to Phase I Emergency Recall Operations. Another adoptable annex was added for supplemental escape devices and systems.

The 2012 edition expanded what had been the definitions of *noncombustible material* and *limited-combustible material* and moved the material to new subsections in Chapter 4. The material addressing elevators for occupant controlled evacuation, which had comprised Annex B, was moved to Chapter 7. A new section was added to Chapter 7 to address normally unoccupied building service equipment support areas. The Chapter 8 table addressing minimum fire protection ratings for opening protectives was expanded. Provisions for carbon monoxide detection were added to Chapter 9. Requirements for carbon monoxide detection were added to some of the occupancy chapters. The health care occupancies provisions were modified to permit the health care setting to be made more homelike.

The 2015 edition included new provisions in Chapter 4 detailing the code requirements hierarchy to be applied where a provision in one chapter conflicts with a provision in another chapter. Means of egress provisions were revised or added relative to rooms opening directly onto an exit enclosure, door opening threshold height for spaces not normally occupied, door encroachment on egress width, existing door frames without labels, security access turnstiles, handrail orientation on flaring-width stairs, horizontal exit stacking, horizontal exit exterior wall extensions, elevators in towers, occupant evacuation elevators, and occupant load factors for ambulatory health care and concentrated business use. Atrium walls are permitted to serve as part of the separation for creating separated occupancies on a story-by-story basis. The provisions for the inspection of door assemblies were revised so that fire-rated doors are addressed in Chapter 8 and non-rated egress doors in Chapter 7. The Chapter 8 table addressing minimum fire protection rating for opening protectives was again expanded. Provisions for alcohol-based hand-rub dispensers were added to Chapter 8 so they can be referenced by the occupancy chapters. The high-rise building provisions of Chapter 11 were expanded to include remote video monitoring of exit stair enclosures. The assembly occupancy life safety evaluation provisions were expanded. The day care and residential board and care occupancy provisions were revised to permit more than one floor level to be considered the level of exit discharge. The health care occupancy provisions were further revised to permit facilities to be made more home-like, including a reduction in nursing home minimum corridor width and the clarification of permitted smoke alarm placement for kitchens that are open to the corridor. Health care occupancy doors subject to locking are permitted to be disguised with murals. Smoke barriers are permitted to be omitted on a non-health care floor below a health care floor. The ambulatory health care occupancy chapters were rewritten to be self-contained, removing the need to reference the business occupancy chapters.

The 2018 edition expanded the *Code's* scope to include hazardous materials emergencies, injuries from falls, and emergency communications. In Chapter 4, a reference was added to NFPA 241 for construction, alteration, and demolition operations, and new requirements for fire-retardant-treated wood. In Chapter 7, the terms *electrically controlled egress door assemblies*, *delayed-egress locking systems*, and *access-controlled egress door assemblies* were revised to *door hardware release of electrically locked egress door assemblies*, *delayed-egress electrical locking systems*, and *sensor-release of electrical locking systems*, respectively. New Chapter 7 criteria was added that permits occupant load to be reduced to available egress capacity as was previously permitted only for building rehabilitation. In Chapter 8, wall marking and identification provisions for fire barriers, smoke barriers, and smoke partitions were added. Opening protective requirements were substantially revised and reorganized. A reference to NFPA 4 was added to Chapter 9 for integrated fire protection and life safety system testing and new provisions for risk analyses for mass notification systems. In Chapter 10, the interior finish requirements for expanded vinyl wall coverings and textile wall and ceiling coverings were revised, and new provisions for laminated products and facings or wood veneers were added. In Chapter 11, the provisions for airport traffic control towers were revised, and the emergency lighting and standby power requirements for high-rise buildings were reorganized. Animal housing facilities were added as special structures. Carbon-monoxide detection requirements for new assembly occupancies were added to Chapter 12. In Chapters 14–17, 38, and 39, criteria for door locking to prevent unwanted entry in educational, day-care, and business occupancies were added. The sprinkler requirement threshold for new educational occupancies in Chapter 14 was revised. Health care corridor projection allowances in Chapters 18 and 19 were modified to correlate with accessibility standards and to permit the installation of emergency stair travel devices and self-retracting seats. New provisions were added to permit health care and ambulatory health care smoke compartments up to 40,000 ft² (3720 m²) in area. In Chapters 20 and 21, door locking provisions for patient special needs in ambulatory health care occupancies were revised. In Chapter 24, criteria for bathtub and shower grab bars were added and then

referenced by numerous occupancy chapters. Attic protection requirements were added to Chapters 28 and 30 for certain new hotels and dormitories and apartment buildings. In Chapter 32, carbon-monoxide detection requirements for new residential board and care occupancies were added. Mall terminology was revised in Chapters 36 and 37, and new provisions were added to differentiate between open and enclosed mall concourses. In Chapters 38 and 39, a reference to NFPA 99 for medical gases in business occupancies was added. A new Annex C was added to provide guidance on several NFPA hazardous materials standards.

Selected key revisions in the 2021 edition include: allowance for a second door lock/latch releasing motion on existing educational and day care occupancy classroom doors to accommodate lockdown events; mandatory sprinklers in new day care occupancies with more than 12 clients; modified sprinkler requirements for existing high-rise buildings containing ambulatory health care, business, industrial, or apartment building occupancies; modified construction limits for existing nursing homes; clarification that non-required fire doors are not subject to the inspection requirements of NFPA 80; provisions for temporary barriers to separate areas under construction in health care and ambulatory health care occupancies; updated criteria for special amusement buildings; mandatory sprinkler requirement for new bars and restaurants with an occupant load of 50 or more; minimum requirement for fire department two-way communication signal strength in all new buildings; carbon monoxide detection requirement for existing hotels and dormitories; low-frequency fire alarm notification signals in new hotel, dormitory, and apartment building sleeping rooms per NFPA 72; and provisions for burglar bars/grates on means of escape windows in residential occupancies.

To the User

The following comments are offered to assist in the use of the *Life Safety Code*. Additional help on using the *Life Safety Code* can be obtained by attending one of the seminars NFPA conducts on the *Life Safety Code* or by using the *Life Safety Code Handbook* available from NFPA. Further information on these seminars is available through the NFPA Division of Continuing Education.

Essentially, the *Code* comprises four major parts. The first part consists of Chapters 1 through 4, Chapters 6 through 11, and Chapter 43; these are often referred to as the base chapters or fundamental chapters. The second part is Chapter 5, which details the performance-based option. The next part consists of Chapters 12 through 42, which are the occupancy chapters. The fourth and last part consists of Annex A through Annex D, which contain useful additional information.

A thorough understanding of Chapters 1 through 4, Chapters 6 through 11, and Chapter 43 is necessary to use the *Code* effectively, because these chapters provide the building blocks on which the requirements of the occupancy chapters are based. Note that many of the provisions of Chapters 1 through 4 and Chapters 6 through 11 are mandatory for all occupancies. Some provisions are mandated only when referenced by a specific occupancy, while others are exempted for specific occupancies. Often, in one of the base chapters, especially in Chapter 7, the phrase “where permitted by Chapters 11 through 43” appears. In this case, that provision can be used only where specifically permitted by an occupancy chapter. For example, the provisions of 7.2.1.6.1 on delayed-egress electrical locking systems are permitted only when permitted by Chapters 11 through 43. Permission to use delayed-egress electrical locking systems is normally found in the “____.2.2” subsection of each occupancy chapter. For example, 12.2.2.2.5 specifically permits the use of delayed-egress electrical locking systems in new assembly occupancies. If this permission is not found in an occupancy chapter, delayed-egress electrical locking systems cannot be used. Similar types of restricted permission are found for such items as security grilles, double-cylinder locks, revolving doors, and so forth. In other locations in the base chapters, the wording “unless prohibited by Chapters 11 through 43” is used. In this case, the provision is permitted in all occupancies, unless specifically prohibited by an occupancy chapter.

Metric units of measurement in this *Code* are in accordance with the modernized metric system known as the International System of Units (SI). The unit liter, which is outside of but recognized by SI, is commonly used and is therefore used in this *Code*. In this *Code*, inch-pound units for measurements are followed by an equivalent in SI units, as noted in 1.5.2. The inch-pound value and the SI value are each acceptable for use as primary units for satisfying the requirements of this *Code*.

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Committee Scope: This Committee shall have primary responsibility for documents on the protection of human life from fire and other circumstances capable of producing similar consequences and for the nonemergency and emergency movement of people.

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Robert D. Fiedler, City of Lincoln, NE [E]
(Alt. to Charles J. Schweitzer)

Jerrold S. Gorrell, Theatre Safety Programs, AZ [U]
(Alt. to Karl G. Ruling)

Shawn M. Hanson, Greater Naples Fire Rescue District, FL [E]
(Alt. to Eric Center)

Christopher M. Jenkins, Church of Jesus Christ of Latter-day Saints, UT [U]
(Alt. to Max L. Gandy)

Gregory E. Harrington, NFPA Staff Liaison

David Kurasz, New Jersey Fire Sprinkler Advisory Board, NJ [M]
(Alt. to Ryan Lee Peterson)

Julie A. Little, Office of State Fire Marshal, LA [E]
(Alt. to Elbert R. Thomas, Jr.)

Jason A. Lupa, Siemens Industry, Inc., NJ [M]
(Alt. to Daniel P. Finnegan)

Van Hoover Patterson, State Of Florida NE Region Jacksonville Office, FL [E]
(Voting Alt.)

Janet A. Washburn, Bonita Springs Fire Control District, FL [E]
(Alt. to Stephen C Hesson)

Toby J. White, Arup, MA [SE]
(Alt. to Jeffrey S. Tubbs)

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on protection of human life and property from fire and other circumstances capable of producing similar consequences, and on the nonemergency and emergency movement of people in assembly occupancies, tents, and membrane structures.

Technical Committee on Board and Care Facilities (SAF-BCF)

John A. Rickard, *Chair*
P3 Consulting, TX [SE]

Tracy Vecchiarelli, *Administrative Secretary*
National Fire Protection Association, MA

Scott D. Allen, LifeServices Management Corporation, PA [U]

Roland A. Asp, National Fire Sprinkler Association, Inc., MD [M]

Chad E. Beebe, ASHE - AHA, WA [U]

Tracey D. Bellamy, Telgian Corporation, GA [SE]

Harry L. Bradley, Maryland State Fire Marshal's Office, MD [E]
Rep. International Fire Marshals Association

Richard L. Day, Michigan State Fire Marshal's Office, MI [E]

Rebekah L. Eaddy, Texas Health and Human Services Commission, TX [E]

Martin J. Farraher, Siemens Industry, Inc., IL [M]
Rep. National Electrical Manufacturers Association

Nicholas E. Gabriele, JENSEN HUGHES, CT [SE]

Steven Heaney, Brandywine Senior Living, NJ [U]
Rep. American Health Care Association

Adam C. Jones, Buechel Fire Protection District, KY [E]

Henry Kowalenko, Illinois Department of Public Health, IL [E]

Peter A. Larrimer, US Department of Veterans Affairs, PA [U]

Mark Larson, Mark Larson And Associates LLC, ID [U]
Rep. National Disability Rights Network

Randy S. McDermott, US Department of Health & Human Services, TX [E]

David E. Mills, UL LLC, IL [RT]

Gayanne Coral Pacholzuk, Kelowna Fire Department, Canada [E]

Carter J. Rierison, Best Defense Fire Protection, WI [IM]

Heather Roth, New York State Office of Fire Prevention and Control, NY [E]

Terry Schultz, Code Consultants, Inc., MO [SE]

Joshua Talley, Koffel Associates, Inc., MD [SE]

Jon Taluba, Greenwood Sales, NH [M]

Yunyong Pock Utiskul, Exponent, Inc., MD [SE]

Alternates

Kerry M. Bell, UL LLC, IL [RT]
(Alt. to David E. Mills)

Robert J. Dobberstein, JENSEN HUGHES, NY [SE]
(Alt. to Nicholas E. Gabriele)

Kurtis Grant, US Department of Health & Human Services, GA [E]
(Alt. to Randy S. McDermott)

Kevin Knippa, Texas Health and Human Services Commission, TX [E]
(Alt. to Rebekah L. Eaddy)

Henry Kowalenko, Illinois Department of Public Health, IL [E]
(Alt. to Dennis L. Schmitt)

James K. Lathrop, Koffel Associates, Inc., CT [SE]
(Alt. to Joshua Talley)

Kaitlin McGillvray, Code Consultants, Inc., NY [SE]
(Alt. to Anne M. Guglielmo)

Pamela Reno, Telgian, OH [SE]
(Alt. to Tracey D. Bellamy)

Stephen G. Rood, Legrand North America, NY [M]
(Alt. to Martin J. Farraher)

Dennis L. Schmitt, Illinois Department of Public Health, IL [E]
(Alt. to Henry Kowalenko)

Terry L. Victor, Johnson Controls, MD [M]
(Alt. to Roland A. Asp)

Fred Worley, Fred Worley Architect, TX [SE]
(Alt. to John A. Rickard)

Tracy Vecchiarelli, NFPA Staff Liaison

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on protection of human life and property from fire and other circumstances capable of producing similar consequences, and on the emergency movement of people in residential board and care facilities.

Technical Committee on Building Service and Fire Protection Equipment(SAF-BSF)

Raymond A. Grill, *Chair*
Arup, DC [SE]

Tracy Vecchiarelli, *Administrative Secretary*
National Fire Protection Association, MA

Jodi S Balido, Dominion Energy Services Inc, VA [U]
Rep. Edison Electric Institute

Harry L. Bradley, Maryland State Fire Marshal's Office, MD [E]
Rep. International Fire Marshals Association

Kevin L. Brinkman, National Elevator Industry, Inc., IL [M]
Rep. National Elevator Industry Inc.

Pat D. Brock, Oklahoma State University, OK [SE]

Flora F. Chen, Hayward Fire Department, California, CA [E]

Stephen E. Dale, Cincinnati Insurance Company, OH [I]

Bryan Dempsey, Vivint, TX [IM]
Rep. Electronic Security Association

Paul M. Donga, Boston Fire Department, MA [E]

Jeffrey M. Hugo, National Fire Sprinkler Association, Inc., MI [M]

Claude O. Hutton, Virginia State Fire Marshal's Office, VA [E]

Joseph M. Jardin, Fire Department City of New York, NY [C]
Rep. NFPA Fire Service Section

Michael Kellett, State of Connecticut, CT [E]
Rep. Connecticut State Fire Marshal/Connecticut Fire Marshals Association

David A. Killian, Walt Disney Parks & Resorts, CA [U]

Richard L. Klinker, Klinker & Associates, Inc., MD [SE]

Peter A. Larrimer, US Department of Veterans Affairs, PA [U]

Daniel J. Lazarz, EYP Architecture & Engineering, MA [SE]

Scott E. Panowitz, BFPE International, MD [M]
Rep. Fire Suppression Systems Association

Ray F. Reed, Highrise Fire Consultants, TX [L]
Rep. International Association of Fire Fighters

Rodger Reiswig, Johnson Controls, FL [M]

Richard Jay Roberts, Honeywell Fire Safety, IL [M]
Rep. National Electrical Manufacturers Association

Kurt A. Ruchala, JENSEN HUGHES, MA [SE]

Lawrence J. Shudak, UL LLC, IL [RT]

Michael R. Szmanda, Certification & Training Corporation, MN [IM]

Todd W. Warner, Brooks Equipment Company, Inc., MT [M]
Rep. Fire Equipment Manufacturers' Association

Carl D. Wren, City of Austin, TX [E]

David M. Wyatt, Pacific Northwest National Laboratory-Battelle, WA [U]

Alternates

Daniel P. Finnegan, Siemens Industry, Inc., IL [M]
(Alt. to Richard Jay Roberts)

Greg Gottlieb, Hauppauge Fire District, NY [C]
(Alt. to Joseph M. Jardin)

Claudia Hagood, Klinker and Associates, Inc., MD [E]
(Alt. to Richard L. Klinker)

Mark Hopkins, National Fire Sprinkler Association, MD [M]
(Alt. to Jeffrey M. Hugo)

Bryan Lawrence Hoskins, Oklahoma State University, OK [SE]
(Alt. to Pat D. Brock)

Ignatius Kapalczynski, Simsbury Fire District, CT [E]
(Alt. to Michael Kellett)

Tracy Vecchiarelli, NFPA Staff Liaison

Roy C. Kimball, Brooks Equipment Company, Inc., NC [M]
(Alt. to Todd W. Warner)

Peter Leszczak, US Department of Veterans Affairs, CT [U]
(Alt. to Peter A. Larrimer)

Marc Mueller, Thyssenkrupp Elevator, TN [M]
(Alt. to Kevin L. Brinkman)

Joseph J. Watson, JENSEN HUGHES, RI [SE]
(Alt. to Kurt A. Ruchala)

Kristian White, Space Age Electronics, Inc., MA [M]
(Voting Alt.)

Justin Yates, Cincinnati Insurance Company, AR [I]
(Alt. to Stephen E. Dale)

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents on the application of fire protection systems including detection, alarm, and suppression, and the life safety impact of various building systems.

Technical Committee on Detention and Correctional Occupancies(SAF-DET)

Randy Gaw, Chair

DET-CORR Fire Safety Consulting, Canada [SE]

Jen Sisco, Administrative Secretary

National Fire Protection Association, MA

Clay P. Aler, Koffel Associates, Inc., MD [SE]

Tracy Bollig, American Fire Sprinkler Corporation, KS [M]
Rep. National Fire Sprinkler Association

Peter J. Collins, US Department of Justice, DC [U]

Michael DiMascio, Arup, MA [SE]

Nolan T Griffiths, Massachusetts Department of Correction (MA DOC), MA [U]

Rick Heffernan, SDi, NJ [M]

Rep. National Electrical Manufacturers Association

John Kelly, Washington DC Fire & EMS Department, MD [E]

Michael Kruszelnicki, Correctional Service of Canada, Canada [E]

Troy A. Lumley, South McCreary Fire & Rescue, KY [E]

Van Hoover Patterson, State Of Florida NE Region Jacksonville Office, FL [E]

Robert R. Perry, Robert Perry Associates Inc., IL [M]

Jack Poole, Poole Fire Protection, Inc., KS [SE]

Terry Schultz, Code Consultants, Inc., MO [SE]

James A. Stapleton, Jr., Habersham Metal Products Company, GA [M]

Rep. National Assn. of Architectural Metal Manufacturers

Garrick Youngberg, Siemens, OR [M]

Rep. Automatic Fire Alarm Association, Inc.

Alternates

Kina Campbell, Koffel Associates, MD [SE]

(Alt. to Clay P. Aler)

Julian Castaneda, US Department of Justice, DC [U]

(Alt. to Peter J. Collins)

Laura Frye, Door And Hardware Institute, VA [M]

(Alt. to Roslyn Shender)

James Lewis, American Fire Sprinkler Corporation, KS [M]

(Alt. to Tracy Bollig)

Joseph Plati, Code Consultants, Inc., NY [SE]

(Alt. to Terry Schultz)

Andrew W. Poole, Poole Fire Protection, Inc., KS [SE]

(Alt. to Jack Poole)

Rodger Reiswig, Johnson Controls, FL [M]

(Alt. to Rick Heffernan)

Ryan Sandler, Honeywell, CA [M]

(Alt. to Garrick Youngberg)

Nonvoting

Reginald D. Jackson, US Department of Labor, DC [E]

Jen Sisco, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on protection of human life and property from fire and other circumstances capable of producing similar consequences, and on the emergency movement of people in detention and correctional occupancies.

Technical Committee on Educational and Day-Care Occupancies (SAF-END)

Matthew J. Mertens, *Chair*
North Shore Fire Department, WI [E]
Rep. International Fire Marshals Association

Kristin Bigda, *Administrative Secretary*
National Fire Protection Association, MA

Mohammed Alsulaiti, State of Qatar Ministry of Interior-Qatar Civil Defense, Qatar [E]
Dorn J. Beddow, Lee County School District (LCSD), FL [U]
Scott J. Blaser, Florida School Boards Association, FL [U]
Samuel S. Dannaway, Coffman Engineers/S. S. Dannaway Associates, Inc., HI [SE]
Richard L. Day, Michigan State Fire Marshal's Office, MI [E]
Richard M. DiMisa, Code Consultants, Inc., MO [SE]
Jason D. Ellis, University of Kentucky, KY [U]
Keith S. Frangiamore, Fire Safety Consultants, Inc., IL [SE]
Max L. Gandy, The Church of Jesus Christ of Latter-day Saints, UT [U]
Jeffrey L. Haidacher, Fairfax County Public Schools, VA [U]
Raymond N. Hansen, US Department of the Air Force, FL [U]
Howard Hopper, UL LLC, CA [RT]
Terrence J. Julka, J. F. Ahern Company, WI [M]
Rep. National Fire Sprinkler Association

Rosa Lazebnik, Primera Engineers, IL [SE]
Alfred J. Longhitano, Alfred J. Longhitano, P.E., LLC, NY [SE]
Maria B. Marks, Siemens Industry, Inc., MD [M]
Rep. National Electrical Manufacturers Association
Richard E. Merck, Montgomery County Fire & Rescue Service, MD [E]
Michael Naber, JENSEN HUGHES, CO [M]
Rep. Automatic Fire Alarm Association, Inc.
Kurt A. Roeper, ASSA ABLOY, CT [M]
Rep. Steel Door Institute
Michael L. Savage, Sr., Marion County Building Safety, FL [E]
Michael L. Sinsigalli, West Hartford Fire Department, CT [E]
Catherine L. Stashak, Office of the Illinois State Fire Marshal, IL [E]
Rep. Office of the Illinois State Fire Marshal
Aleksy L. Szachnowicz, Anne Arundel County Public Schools, MD [U]

Alternates

Clay P. Aler, Koffel Associates, Inc., MD [SE]
(Voting Alt.)
Judy Biddle, US Department of the Air Force, FL [U]
(Alt. to Raymond N. Hansen)
Brandon Ernest, University of Kentucky, KY [U]
(Alt. to Jason D. Ellis)
Thomas R. Janicak, Ceco Door Products, IL [M]
(Alt. to Kurt A. Roeper)
Christopher M. Jenkins, Church of Jesus Christ of Latter-day Saints, UT [U]
(Alt. to Max L. Gandy)

Larry D. Rietz, JENSEN HUGHES, CO [M]
(Alt. to Michael Naber)
Richard Jay Roberts, Honeywell Fire Safety, IL [M]
(Alt. to Maria B. Marks)
Karl Wiegand, Globe Fire Sprinkler Corporation, MI [M]
(Alt. to Terrence J. Julka)

Kristin Bigda, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on protection of human life and property from fire and other circumstances capable of producing similar consequences, and on the emergency movement of people in educational occupancies and day-care occupancies.

Technical Committee on Fire Protection Features (SAF-FIR)

John F. Devlin, *Chair*
JENSEN HUGHES, MD [SE]
Rep. JENSEN HUGHES

Jen Sisco, *Administrative Secretary*
National Fire Protection Association, MA

Eddie Dewayne Alday, Agency for Health Care Administration, FL [E]

Gregory J. Cahanin, Cahanin Fire & Code Consulting, FL [U]
Rep. Louisiana State Firemen's Association

Nicholas A. Dawe, Cobb County Fire Marshal's Office, GA [E]

Jeffrey T. Dudley, National Aeronautics & Space Administration, Kennedy Space Center (NASA), FL [U]

Edward S. Goldhammer, Hilti, CA [M]

Joseph Graupmann, AECOM Technology, VA [SE]

Jack A. Gump, Consolidated Nuclear Security, TN [U]

William J. Hall, Portland Cement Association, VA [M]

Joseph Patrick Higgins, US Department of the Navy, FL [E]

Howard Hopper, UL LLC, CA [RT]

Jeffrey M. Hugo, National Fire Sprinkler Association, Inc., MI [M]
Rep. National Fire Sprinkler Association

Jonathan Humble, American Iron and Steel Institute, CT [M]

Waymon Jackson, University of Texas at Austin, TX [U]

Adam C. Jones, Buechel Fire Protection District, KY [E]

William E. Koffel, Koffel Associates, Inc., MD [M]
Rep. Glazing Industry Code Committee

William J. McHugh, Jr., Firestop Contractors International Association, IL [IM]

Rep. Firestop Contractors International Association

Jeramie W. Morris, Dow Corning Corporation, MI [M]

Dennis A. Richardson, American Wood Council, CA [M]

Kurt A. Roeper, ASSA ABLOY, CT [M]

Rep. Steel Door Institute

Gregory K. Shino, NV5/JBA Consulting Engineers, NV [SE]

Catherine L. Stashak, Office of the Illinois State Fire Marshal, IL [E]

Rep. Office of the Illinois State Fire Marshal

Nathan B. Wittasek, Simpson Gumpertz & Heger (SGH), CA [SE]

Alexander Frederick Zivnaska, Code Consultants, Inc., MO [SE]

Alternates

Farid Alfawakhiri, American Iron and Steel Institute, IL [M]
(Alt. to Jonathan Humble)

David Cook, Ralph Gerdes Consultants, LLC, IN [SE]
(Voting Alt.)

Erin N. Crowley, Code Consultants, Inc., MO [SE]
(Alt. to Alexander Frederick Zivnaska)

Timmy Dee, Consolidated Nuclear Security Y-12, LLC, TN [U]
(Alt. to Jack A. Gump)

Jennifer Klein Gould, Marshall A. Klein And Associates, Inc., VA [SE]
(Voting Alt.)

Shane Hatmaker, AECOM Technology, DC [SE]
(Alt. to Joseph Graupmann)

Thomas R. Janicak, Ceco Door Products, IL [M]
(Alt. to Kurt A. Roeper)

Josh Lambert, University of Texas at Austin, TX [U]
(Alt. to Waymon Jackson)

Chris Moran, JENSEN HUGHES, MD [SE]
(Alt. to John F. Devlin)

Raymond C. O'Brocki, American Wood Council, MD [M]
(Alt. to Dennis A. Richardson)

Lennon A. Peake, Koffel Associates, Inc., MD [M]
(Alt. to William E. Koffel)

Erne Rodriguez, Jr., Wiginton Fire Protection Engineering, Inc., FL [M]
(Alt. to Jeffrey M. Hugo)

Richard N. Walke, UL LLC, IL [RT]
(Alt. to Howard Hopper)

Nonvoting

Michael Earl Dillon, Dillon Consulting Engineers, Inc., CA [SE]
Rep. TC on Air Conditioning

Jen Sisco, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on construction compartmentation, including the performance of assemblies, openings, and penetrations, as related to the protection of life and property from fire and other circumstances capable of producing similar consequences.

Technical Committee on Fundamentals (SAF-FUN)

Chris Jelenewicz, *Chair*

Society of Fire Protection Engineers, MD [SE]

Gregory E. Harrington, *Administrative Secretary*

National Fire Protection Association, MA

Nasser Ahmed Al Zeyara, Qatar Civil Defense, Qatar [E]
Farid Alfawakhiri, American Iron and Steel Institute, IL [M]
Wayne G. Chip Carson, Carson Associates, Inc., VA [SE]
Amy Y. Cheng, Clark County Department of Development Services, NV [E]
Daniel P. Finnegan, Siemens Industry, Inc., IL [M]
 Rep. National Electrical Manufacturers Association
David W. Frable, US General Services Administration, IL [U]
 Rep. US General Services Administration
Norman E. Groner, John Jay College of Criminal Justice, NY [SE]
Stanley C. Harbuck, School of Building Inspection, MA [C]
 Rep. American Public Health Association
Mark Hopkins, National Fire Sprinkler Association, MD [M]
 Rep. National Fire Sprinkler Association
David J. Jacoby, Simpson Gumpertz & Heger, NY [SE]

David P. Klein, US Department of Veterans Affairs, DC [U]
 Rep. US Department of Veterans Affairs
Scott T. Laramie, AON Property Risk, CA [I]
James K. Lathrop, Koffel Associates, Inc., CT [SE]
Ricardo Murga, US Department of Health & Human Services, MT [E]
Milosh T. Puchovsky, Worcester Polytechnic Institute, MA [SE]
Rodger Reiswig, Johnson Controls, FL [M]
 Rep. Automatic Fire Alarm Association, Inc.
Jon G. Roberts, UL LLC, OK [RT]
Michael Schmeida, Gypsum Association, OH [M]
David P. Tyree, American Wood Council, CO [M]
Joshua Vann, MB Healthcare, NJ [U]

Alternates

Sharon S. Gilyeat, Koffel Associates, Inc., MD [SE]
 (Alt. to James K. Lathrop)
Jeffrey M. Hugo, National Fire Sprinkler Association, Inc., MI [M]
 (Alt. to Mark Hopkins)
Jonathan Humble, American Iron and Steel Institute, CT [M]
 (Alt. to Farid Alfawakhiri)
Matthew M. Hunter, American Wood Council, PA [M]
 (Alt. to David P. Tyree)
Bruce E. Johnson, UL LLC, NY [RT]
 (Alt. to Jon G. Roberts)

James M. Mundy, Jr., Asset Protection Associates, Ltd., NY [M]
 (Alt. to Rodger Reiswig)
Jake Pauls, Jake Pauls Consulting Services, Canada [C]
 (Alt. to Stanley C. Harbuck)
Victoria B. Valentine, Society of Fire Protection Engineers (SFPE), PA [SE]
 (Alt. to Chris Jelenewicz)
Mike West, Siemens, OR [M]
 (Alt. to Daniel P. Finnegan)

Nonvoting

Pichaya Chantranuwat, Fusion Consultants Co. Ltd/Thailand, Thailand [SE]

Gregory E. Harrington, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on the basic goals, objectives, performance requirements, and definitions for protection of human life and property from fire, earthquake, flood, wind, and other circumstances capable of producing similar consequences, on the nonemergency and emergency movement of people, and on high-rise buildings.

Technical Committee on Health Care Occupancies (SAF-HEA)

William E. Koffel, *Chair*
Koffel Associates, Inc., MD [SE]

Gregory E. Harrington, *Administrative Secretary*
National Fire Protection Association, MA

Kenneth E. Bush, Maryland State Fire Marshal's Office, MD [E]

Rep. International Fire Marshals Association

Wayne G. Chip Carson, Carson Associates, Inc., VA [SE]

Michael A. Crowley, JENSEN HUGHES, TX [SE]

Rep. JENSEN HUGHES

Luke Cummings, Mayo Clinic, MN [U]

Samuel S. Dannaway, Coffman Engineers/S. S. Dannaway Associates, Inc., HI [SE]

Rep. American Society of Safety Professionals

Matthew W. Davy, Arup, MA [SE]

Joseph M. DeRosier, University of Michigan, MI [U]

Alice L. Epstein, CNA Insurance, CO [I]

Martin J. Farraher, Siemens Industry, Inc., IL [M]

Gary Furdell, State of Florida, FL [E]

Robert J. Harmeyer, MSKTD & Associates, IN [SE]

Rep. American Institute of Architects

Donald W. Harris, California Office of Health Planning & Development, CA [E]

Richard M. Horeis, HDR Architecture, Inc., NE [SE]

David P. Klein, US Department of Veterans Affairs, DC [U]

Kevin Knippa, Texas Health and Human Services Commission, TX [E]

Henry Kowalenko, Illinois Department of Public Health, IL [E]

Herman McKenzie, The Joint Commission - SIG, IL [E]

James Merrill II, US Department of Health & Human Services, MD [E]

Rep. US Dept. of Health & Human Services/CMS

James S. Peterkin, TLC Engineering, PA [U]

Rep. NFPA Health Care Section

Ben Pethe, Health Care Consultant, FL [SE]

G. Brian Prediger, US Army Corps of Engineers, VA [U]

John A. Rickard, P3 Consulting, TX [SE]

Richard Jay Roberts, Honeywell Fire Safety, IL [M]

Rep. Automatic Fire Alarm Association, Inc.

Kurt A. Roeper, ASSA ABLOY, CT [M]

Rep. Builders Hardware Manufacturers Assn/Steel Door Institute

Terry Schultz, Code Consultants, Inc., MO [SE]

Steven G. Spaanbroek, MSL Healthcare Partners, IL [U]

Rep. American Society for Healthcare Engineering

Neil Stinnett, Indiana University Health, IN [U]

Joshua Vann, MB Healthcare, NJ [U]

Terry L. Victor, Johnson Controls, MD [M]

Rep. National Fire Sprinkler Association

Michael D. Widdekind, Zurich Services Corporation, MD [I]

Alternates

Chad E. Beebe, ASHE - AHA, WA [U]

(Alt. to Steven G. Spaanbroek)

Bruce D. Brooks, Noelker and Hull Associates, Inc., VA [SE]

(Alt. to Robert J. Harmeyer)

David A. Dagenais, Partners/Wentworth-Douglass Hospital, NH [U]

(Alt. to James S. Peterkin)

Rebekah L. Eaddy, Texas Health and Human Services Commission, TX [E]

(Alt. to Kevin Knippa)

Joshua W. Elvove, Aurora, CO [SE]

(Alt. to Samuel S. Dannaway)

Michael T. Greco, Oliver Fire Protection & Security, PA [M]

(Alt. to Terry L. Victor)

Philip J. Hoge, US Army Corps of Engineers, VA [U]

(Alt. to G. Brian Prediger)

Adrian Hal Key, P3 Consulting, TX [SE]

(Alt. to John A. Rickard)

Peter A. Larrimer, US Department of Veterans Affairs, PA [U]

(Alt. to David P. Klein)

Bret M. Martin, CNA Insurance, NC [I]

(Alt. to Alice L. Epstein)

Lennon A. Peake, Koffel Associates, Inc., MD [SE]

(Alt. to William E. Koffel)

Ajay V. Prasad, JENSEN HUGHES, MD [SE]

(Alt. to Michael A. Crowley)

Dennis L. Schmitt, Illinois Department of Public Health, IL [E]

(Alt. to Henry Kowalenko)

Deborah L. Shaner, Shaner Life Safety, CO [M]

(Alt. to Richard Jay Roberts)

Wesley Springer, Siemens Industry, Inc., FL [M]

(Alt. to Martin J. Farraher)

James R. Stuckey, Agency For Health Care Administration, FL [E]

(Alt. to Gary Furdell)

Kenneth Sun, US Public Health Service, CO [E]

(Alt. to James Merrill II)

Alexander Frederick Zivnuska, Code Consultants, Inc., MO [SE]

(Alt. to Terry Schultz)

Nonvoting

Pichaya Chantranuwat, Fusion Consultants Co. Ltd/Thailand, Thailand [SE]

David M. Sine, National Center for Patient Safety, MI [U]

Rep. National Association of Psychiatric Health Systems

Gregory E. Harrington, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on protection of human life and property from fire and other circumstances capable of producing similar consequences, and on the emergency movement of people in health care occupancies.

Technical Committee on Industrial, Storage, and Miscellaneous Occupancies (SAF-IND)

Carl D. Wren, *Chair*
City of Austin, TX [E]

Jen Sisco, *Administrative Secretary*
National Fire Protection Association, MA

Ali Almannai, State of Qatar-Ministry of Interior General Administration of Civil Defense, Qatar [E]
Donald C. Birchler, FP&C Consultants KC, LLC., MO [SE]
Ryan Cummings, US Department of Transportation, DC [E]
Alberto Cusimano, Dupont International SA, Switzerland [M]
Sheldon Dacus, Security Fire Protection Company, TN [M]
Rep. National Fire Sprinkler Association
Stephen E. Dale, Cincinnati Insurance Company, OH [I]
Nicholas A. Dawe, Cobb County Fire Marshal's Office, GA [E]
John Desrosier, Globe Fire Sprinkler Corporation, MI [IM]
Rep. American Fire Sprinkler Association
Jeffrey T. Dudley, National Aeronautics & Space Administration, Kennedy Space Center (NASA), FL [U]
Rob Early, Compressed Gas Association, NY [M]
Robert E. Hanson, Savannah River Nuclear Solutions, GA [U]
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Dennis A. Richardson, American Wood Council, CA [M]
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Rep. National Propane Gas Association
John Vosicky, Sherwin Williams, OH [U]
Michael S. White, Siemens Building Technologies, OH [M]
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(Alt. to John Vosicky)

Jen Sisco, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on protection of human life and property from fire and other circumstances capable of producing similar consequences, and on the emergency movement of people in industrial and storage occupancies, special structures, and windowless and underground buildings.

Technical Committee on Interior Finish and Contents (SAF-INT)

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Cobb County Fire Marshal's Office, GA [E]

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National Fire Protection Association, MA

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Matthew Carrigan, Montgomery County Fire Rescue Service, MD [L]

Rep. International Association of Fire Fighters

Tiffney Arlene-Cates Chen, Smithsonian Institution, MD [U]

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Tracy L. Vecchiarelli, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on limiting the impact of interior finish, furnishings and building contents on protection of human life and property from fire and other circumstances capable of producing similar consequences, and on the emergency movement of people.

Technical Committee on Means of Egress (SAF-MEA)

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Rep. National Electrical Manufacturers Association
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Rep. Door and Hardware Institute
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(Alt. to Bryan Lawrence Hoskins)
David A. de Vries, Firetech Engineering Inc., IL [SE]
(Alt. to Joshua W. Elvove)
Paul L. Dove, Coldwater, MI [E]
(Alt. to Ronald R. Farr)
Laura Frye, Door And Hardware Institute, VA [M]
(Alt. to Robert R. Perry)
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R. T. Leicht, State of Delaware, DE [E]
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William R. Hamilton, US Department of Labor, DC [E]
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Gregory E. Harrington, NFPA Staff Liaison

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Committee Scope: This Committee shall have primary responsibility for documents on the general requirements for safe egress for protection of human life from fire and other circumstances capable of producing similar consequences, and on the nonemergency and emergency movement of people.

Technical Committee on Mercantile and Business Occupancies (SAF-MER)

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Rep. The Home Depot

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Rep. National Fire Sprinkler Association

Kenneth E. Bush, Maryland State Fire Marshal's Office, MD [E]
Rep. International Fire Marshals Association

Anthony W. Cole, Wal-Mart Stores, Inc., CA [U]

Nicholas A. Dawe, Cobb County Fire Marshal's Office, GA [E]

Kevin L. Derr, US Architect of the Capitol, DC [E]

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Rep. American Society of Safety Professionals

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Daniel Ford, WSP Middle East, United Arab Emirates [SE]

David W. Frable, US General Services Administration, IL [U]

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Rep. National Electrical Manufacturers Association

Daniel J. Gauvin, Johnson Controls, MA [M]

Anthony C. Gumkowski, Travelers Insurance Company, CT [I]

Jonathan Humble, American Iron and Steel Institute, CT [M]

Jeff Martin, Elite Fire Protection, Canada [IM]

Rep. National Association of Fire Equipment Distributors

Bridget Mourao, Emory University, GA [E]

Sarah A. Rice, The Preview Group, Inc., OH [SE]

Jeffrey Shirey, University of Maryland - Office of the Fire Marshal, MD [E]

James B. Smith, American Wood Council, WI [M]

Warren G. Stocker, The Albertson Companies, CA [U]

John Vosicky, Sherwin Williams, OH [U]

Timothy Wensus, Jensen Hughes, RI [SE]

Ernest D. Yonkers, Harrison French and Associates, AR [SE]

Alternates

Farid Alfawakhiri, American Iron and Steel Institute, IL [M]
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Andrew G. Berezowski, Honeywell Inc., CT [M]
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Kina Campbell, Koffel Associates, MD [SE]
(Voting Alt.)

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(Alt. to Marvin Dwayne Garriss)

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Committee Scope: This Committee shall have primary responsibility for documents on protection of human life and property from fire and other circumstances capable of producing similar consequences, and for the emergency movement of people in mercantile and business occupancies.

Technical Committee on Residential Occupancies (SAF-RES)

James K. Lathrop, *Chair*
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Rep. National Association of Home Builders
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William J. Hall, Portland Cement Association, VA [M]
Stanley C. Harbuck, School of Building Inspection, MA [C]
Rep. American Public Health Association

Kenneth E. Isman, University of Maryland, MD [SE]
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Henry Paszczuk, Connecticut Department of Public Safety, CT [E]
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Jake Pauls, Jake Pauls Consulting Services, Canada [C]
(Alt. to Stanley C. Harbuck)
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(Alt. to Paul D. Coats)
Jeffrey Shirey, University of Maryland - Office of the Fire Marshal, MD [E]
(Alt. to Harry L. Bradley)
Joshua Talley, Koffel Associates, Inc., MD [SE]
(Alt. to James K. Lathrop)

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Committee Scope: This Committee shall have primary responsibility for documents on protection of human life and property from fire and other circumstances capable of producing similar consequences, and on the emergency movement of people in hotels, dormitories, apartments, lodging and rooming houses, and one- and two-family dwellings.

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Life Safety Code

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NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced and extracted publications can be found in Chapter 2 and Annex D.

Chapter 1 Administration

1.1* Scope.

1.1.1 Title. NFPA 101, *Life Safety Code*, shall be known as the *Life Safety Code*®, is cited as such, and shall be referred to herein as “this Code” or “the Code.”

1.1.2 Danger to Life from Fire. The Code addresses those construction, protection, and occupancy features necessary to minimize danger to life from the effects of fire, including smoke, heat, and toxic gases created during a fire.

1.1.3 Egress Facilities. The Code establishes minimum criteria for the design of egress facilities so as to allow prompt escape of occupants from buildings or, where desirable, into safe areas within buildings.

1.1.4 Other Fire-Related Considerations. The Code addresses other considerations that are essential to life safety in recognition of the fact that life safety is more than a matter of egress. The Code also addresses protective features and systems, building services, operating features, maintenance activities, and other provisions in recognition of the fact that achieving an acceptable degree of life safety depends on additional safe-

guards to provide adequate egress time or protection for people exposed to fire.

1.1.5* Hazardous Materials Emergencies. The Code also addresses other considerations that provide for occupant protection during emergency events involving hazardous materials.

1.1.6 Injuries from Falls. The Code also addresses reducing injury to occupants from falls.

1.1.7 Emergency Communications. The Code also addresses other considerations that provide for communications to occupants under emergency conditions and to others.

1.1.8* Considerations Not Related to Fire. The Code also addresses other considerations that, while important in fire conditions, provide an ongoing benefit in other conditions of use, including non-fire emergencies.

1.1.9 Areas Not Addressed. The Code does not address the following:

- (1)* General fire prevention or building construction features that are normally a function of fire prevention codes and building codes
- (2) Prevention of injury incurred by an individual due to that individual's failure to use reasonable care
- (3) Preservation of property from loss by fire
- (4) The retail sale and associated storage of consumer fire-works

1.2* Purpose. The purpose of this Code is to provide minimum requirements, with due regard to function, for the design, operation, and maintenance of buildings and structures for safety to life from fire. Its provisions will also aid life safety in similar emergencies.

1.3 Application.

1.3.1* New and Existing Buildings and Structures. The Code shall apply to both new construction and existing buildings and existing structures.

1.3.2 Vehicles and Vessels. The Code shall apply to vehicles, vessels, or other similar conveyances, as specified in Section 11.6, in which case such vehicles and vessels shall be treated as buildings.

1.4* Equivalency. Nothing in this Code is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this Code.

1.4.1 Technical Documentation. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.4.2 Approval. The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.4.3* Equivalent Compliance. Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this Code.

1.5 Units and Formulas.

1.5.1 SI Units. Metric units of measurement in this *Code* are in accordance with the modernized metric system known as the International System of Units (SI).

1.5.2 Primary Values. The inch-pound value for a measurement, and the SI value given in parentheses, shall each be acceptable for use as primary units for satisfying the requirements of this *Code*.

1.6 Enforcement. This *Code* shall be administered and enforced by the authority having jurisdiction designated by the governing authority.

Chapter 2 Referenced Publications

2.1 General. The documents referenced in this chapter, or portions of such documents, are referenced within this *Code*, shall be considered part of the requirements of this *Code*, and the following shall also apply:

- (1)* Documents referenced in this chapter, or portion of such documents, shall only be applicable to the extent called for within other chapters of this *Code*.
- (2) Where the requirements of a referenced code or standard differ from the requirements of this *Code*, the requirements of this *Code* shall govern.
- (3)* Existing buildings or installations that do not comply with the provisions of the codes or standards referenced in this chapter shall be permitted to be continued in service, provided that the lack of conformity with these documents does not present a serious hazard to the occupants as determined by the authority having jurisdiction.

2.2* NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

- NFPA 1, *Fire Code*, 2021 edition.
- NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*, 2021 edition.
- NFPA 10, *Standard for Portable Fire Extinguishers*, 2018 edition.
- NFPA 11, *Standard for Low-, Medium-, and High-Expansion Foam*, 2016 edition.
- NFPA 12, *Standard on Carbon Dioxide Extinguishing Systems*, 2018 edition.
- NFPA 12A, *Standard on Halon 1301 Fire Extinguishing Systems*, 2018 edition.
- NFPA 13, *Standard for the Installation of Sprinkler Systems*, 2019 edition.
- NFPA 13D, *Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes*, 2019 edition.
- NFPA 13R, *Standard for the Installation of Sprinkler Systems in Low-Rise Residential Occupancies*, 2019 edition.
- NFPA 14, *Standard for the Installation of Standpipe and Hose Systems*, 2019 edition.
- NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*, 2017 edition.
- NFPA 16, *Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems*, 2019 edition.
- NFPA 17, *Standard for Dry Chemical Extinguishing Systems*, 2021 edition.
- NFPA 17A, *Standard for Wet Chemical Extinguishing Systems*, 2021 edition.

NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*, 2019 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*, 2020 edition.

NFPA 30, *Flammable and Combustible Liquids Code*, 2021 edition.

NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products*, 2019 edition.

NFPA 31, *Standard for the Installation of Oil-Burning Equipment*, 2020 edition.

NFPA 40, *Standard for the Storage and Handling of Cellulose Nitrate Film*, 2019 edition.

NFPA 45, *Standard on Fire Protection for Laboratories Using Chemicals*, 2019 edition.

NFPA 54, *National Fuel Gas Code*, 2021 edition.

NFPA 55, *Compressed Gases and Cryogenic Fluids Code*, 2020 edition.

NFPA 58, *Liquefied Petroleum Gas Code*, 2020 edition.

NFPA 70®, *National Electrical Code®*, 2020 edition.

NFPA 72®, *National Fire Alarm and Signaling Code®*, 2019 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2019 edition.

NFPA 82, *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*, 2019 edition.

NFPA 88A, *Standard for Parking Structures*, 2019 edition.

NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, 2021 edition.

NFPA 90B, *Standard for the Installation of Warm Air Heating and Air-Conditioning Systems*, 2021 edition.

NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids*, 2020 edition.

NFPA 92, *Standard for Smoke Control Systems*, 2018 edition.

NFPA 96, *Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations*, 2021 edition.

NFPA 99, *Health Care Facilities Code*, 2021 edition.

NFPA 101A, *Guide on Alternative Approaches to Life Safety*, 2019 edition.

NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives*, 2019 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems*, 2019 edition.

NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, 2019 edition.

NFPA 150, *Fire and Life Safety in Animal Housing Facilities Code*, 2019 edition.

NFPA 160, *Standard for the Use of Flame Effects Before an Audience*, 2021 edition.

NFPA 170, *Standard for Fire Safety and Emergency Symbols*, 2018 edition.

NFPA 204, *Standard for Smoke and Heat Venting*, 2018 edition.

NFPA 211, *Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances*, 2019 edition.

NFPA 220, *Standard on Types of Building Construction*, 2021 edition.

NFPA 221, *Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls*, 2021 edition.

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*, 2019 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 2017 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source*, 2019 edition.

NFPA 257, *Standard on Fire Test for Window and Glass Block Assemblies*, 2017 edition.

NFPA 259, *Standard Test Method for Potential Heat of Building Materials*, 2018 edition.

NFPA 260, *Standard Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture*, 2019 edition.

NFPA 261, *Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes*, 2018 edition.

NFPA 265, *Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile or Expanded Vinyl Wall Coverings on Full Height Panels and Walls*, 2019 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth*, 2019 edition.

NFPA 288, *Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance-Rated Assemblies*, 2017 edition.

NFPA 289, *Standard Method of Fire Test for Individual Fuel Packages*, 2019 edition.

NFPA 400, *Hazardous Materials Code*, 2019 edition.

NFPA 415, *Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways*, 2016 edition.

NFPA 418, *Standard for Heliports*, 2016 edition.

NFPA 495, *Explosive Materials Code*, 2018 edition.

NFPA 701, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, 2019 edition.

NFPA 703, *Standard for Fire-Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials*, 2021 edition.

NFPA 731, *Standard for the Installation of Electronic Premises Security Systems*, 2017 edition.

NFPA 750, *Standard on Water Mist Fire Protection Systems*, 2019 edition.

NFPA 855, *Standard for the Installation of Stationary Energy Storage Systems*, 2020 edition.

NFPA 914, *Code for the Protection of Historic Structures*, 2019 edition.

NFPA 1126, *Standard for the Use of Pyrotechnics Before a Proximate Audience*, 2021 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 2019 edition.

NFPA 2001, *Standard on Clean Agent Fire Extinguishing Systems*, 2018 edition.

2.3 Other Publications.

2.3.1 ACI Publications. American Concrete Institute, 38800 Country Club Drive, Farmington Hills, MI 48331-3434. www.concrete.org

ACI 216.1/TMS 0216.1, *Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*, 2014.

▲ **2.3.2 ANSI Publications.** American National Standards Institute, Inc., 25 West 43rd Street, 4th floor, New York, NY 10036.

ANSI ASC A14.3, *American National Standard for Ladders — Fixed — Safety Requirements*, 2008 (R2018).

ANSI/BHMA A156.3, *Exit Devices*, 2014.

ANSI/BHMA A156.10, *Power Operated Pedestrian Doors*, 2017.

ANSI/BHMA A156.19, *Power Assist and Low Energy Power Operated Doors*, 2013.

ANSI/BHMA A156.27, *Power and Manual Operated Revolving Pedestrian Doors*, 2019.

ANSI/BHMA A156.38, *Low Energy Power Operated Sliding and Folding Doors*, 2014.

2.3.3 ASCE Publications. American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191-4400. www.asce.org

ASCE/SEI 7, *Minimum Design Loads for Buildings and Other Structures*, 2016, including Supplement 1, 2017.

ASCE/SEI/SFPE 29, *Standard Calculation Methods for Structural Fire Protection*, 2005.

2.3.4 ASME Publications. ASME International, Two Park Avenue, New York, NY 10016-5990. www.asme.org

ASME A17.1/CSA B44, *Safety Code for Elevators and Escalators*, 2016.

ASME A17.3, *Safety Code for Existing Elevators and Escalators*, 2017.

ASME A17.7/CSA B44.7, *Performance-Based Safety Code for Elevators and Escalators*, 2007, reaffirmed 2017.

2.3.5 ASSP Publications. American Society of Safety Professionals, 520 N. Northwest Highway, Park Ridge, IL 60068.

ANSI/ASSP A1264.1, *Safety Requirements for Workplace Walking/Working Surfaces and Their Access; Workplace Floor, Wall and Roof Openings; Stairs and Guardrail/Handrail Systems*, 2017.

▲ **2.3.6 ASTM Publications.** ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. www.astm.org

ASTM C1629/C1629M, *Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels*, 2018a.

ASTM D1929, *Standard Test Method for Determining Ignition Temperatures of Plastic*, 2016.

ASTM D2859, *Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials*, 2016.

ASTM D2898, *Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing*, 2010 (2017).

ASTM D3201/D3201M, *Standard Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Based Products*, 2013.

ASTM D5516, *Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant-Treated Softwood Plywood Exposed to Elevated Temperatures*, 2018.

ASTM D5664, *Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant-Treated Lumber*, 2017.

ASTM D6305, *Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing*, 2008 (2015) e1.

ASTM D6841, *Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber*, 2016.

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, 2019a.

ASTM E108, *Standard Test Methods for Fire Tests of Roof Coverings*, 2017.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, 2018c e1.

ASTM E136, *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*, 2019.

ASTM E648, *Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source*, 2017a.

ASTM E814, *Standard Test Method for Fire Tests of Penetration Fire Stop Systems*, 2013a (2017).

ASTM E1354, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*, 2017.

ASTM E1537, *Standard Test Method for Fire Testing of Upholstered Furniture*, 2016.

ASTM E1590, *Standard Test Method for Fire Testing of Mattresses*, 2017.

ASTM E1591, *Standard Guide for Obtaining Data for Fire Growth Models*, 2013.

ASTM E1966, *Standard Test Method for Fire-Resistive Joint Systems*, 2015 (2019).

ASTM E2072, *Standard Specification for Photoluminescent (Phosphorescent) Safety Markings*, 2014.

ASTM E2073, *Standard Test Method for Photopic Luminance of Photoluminescent (Phosphorescent) Markings*, 2019.

ASTM E2307, *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-Story Test Apparatus*, 2015b e1.

ASTM E2404, *Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Polymeric (Including Vinyl) and Wood Wall or Ceiling Coverings, Facings and Veneers, to Assess Surface Burning Characteristics*, 2017.

ASTM E2573, *Standard Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics*, 2017.

ASTM E2579, *Standard Practice for Specimen Preparation and Mounting of Wood Products to Assess Surface Burning Characteristics*, 2019.

ASTM E2599, *Standard Practice for Specimen Preparation and Mounting of Reflective Insulation, Radiant Barrier and Vinyl Stretch Ceiling Materials for Building Applications to Assess Surface Burning Characteristics*, 2018.

ASTM E2652, *Standard Test Method for Assessing Combustibility of Materials Using a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*, 2018.

ASTM E2768, *Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)*, 2011 (2018).

ASTM E2837, *Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies*, 2013 (2017).

ASTM E2965, *Standard Test Method for Determination of Low Levels of Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter*, 2017.

ASTM E3082, *Standard Test Methods for Determining the Effectiveness of Fire Retardant Treatments for Natural Christmas Trees*, 2017 e1.

ASTM F851, *Standard Test Method for Self-Rising Seat Mechanisms*, 1987 (2013).

ASTM F1085, *Standard Specification for Mattress and Box Springs for Use in Berths in Marine Vessels*, 2014.

ASTM F1577, *Standard Test Methods for Detention Locks for Swinging Doors*, 2005 (2019).

ASTM G155, *Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*, 2013.

▲ **2.3.7 FM Global Publications.** FM Global, 270 Central Avenue, P.O. Box 7500, Johnston, RI 02919. www.fmglobal.com

ANSI/FM 4880, *American National Standard for Evaluating the Fire Performance of Insulated Building Panel Assemblies and Interior Finish Materials*, 2017.

FM Approval 6921, *Approval Standard for Containers for Combustible Waste*, 2004.

■ **2.3.8 ICC Publications.** International Code Council, 500 New Jersey Avenue, NW, 6th Floor, Washington, DC 20001-2070.

ICC A117.1, *Accessible and Usable Buildings and Facilities*, 2017.

2.3.9 NEMA Publications. National Electrical Manufacturers Association, 1300 North 17th Street, Suite 900, Arlington, VA 22209.

NEMA SB 30, *Fire Service Annunciator and Interface*, 2005.

■ **2.3.10 RESNA Publications.** Rehabilitation Engineering and Assistive Technology Society of North America, 1560 Wilson Blvd., Suite 850, Arlington, VA 22209.

ANSI/RESNA ED-1, *Emergency Stair Travel Devices Used by Individuals with Disabilities, Volume 1*, 2019.

▲ **2.3.11 UL Publications.** Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062-2096. www.ul.com

UL 9, *Fire Tests of Window Assemblies*, 2009, revised 2015.

UL 10B, *Fire Tests of Door Assemblies*, 2008, revised 2015.

UL 10C, *Positive Pressure Fire Tests of Door Assemblies*, 2016.

UL 263, *Fire Tests of Building Construction and Materials*, 2011, revised 2019.

UL 294, *Access Control System Units*, 2018.

UL 300, *Fire Testing of Fire Extinguishing Systems for Protection of Commercial Cooking Equipment*, 2018.

UL 300A, *Extinguishing System Units for Residential Range Top Cooking Surfaces*, 2006.

UL 305, *Panic Hardware*, 2012, revised 2017.

Shaded text = Revisions. ▲ = Text deletions and figure/table revisions.

• = Section deletions.

■ = New material



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UL 555, *Fire Dampers*, 2006, revised 2016.

UL 555S, *Smoke Dampers*, 2014, revised 2016.

UL 723, *Test for Surface Burning Characteristics of Building Materials*, 2018.

UL 790, *Test Methods for Fire Tests of Roof Coverings*, 2004, revised 2018.

UL 924, *Emergency Lighting and Power Equipment*, 2016, revised 2018.

UL 1040, *Fire Test of Insulated Wall Construction*, 1996, revised 2017.

UL 1278, *Movable and Wall- or Ceiling-Hung Electric Room Heaters*, 2014, revised 2018.

UL 1315, *Metal Waste Paper Containers*, 2017.

UL 1479, *Fire Tests of Penetration Firestops*, 2015.

UL 1489, *Fire Tests of Fire Resistant Pipe Protection Systems Carrying Combustible Liquids*, 2016.

UL 1715, *Fire Test of Interior Finish Material*, 1997, revised 2017.

UL 1784, *Air Leakage Tests of Door Assemblies and Other Opening Protectives*, 2015.

UL 1975, *Fire Tests for Foamed Plastics Used for Decorative Purposes*, 2006.

UL 1994, *Luminous Egress Path Marking Systems*, 2015.

UL 2079, *Tests for Fire Resistance of Building Joint Systems*, 2015.

2.3.12 US Government Publications. US Government Publishing Office, 732 North Capitol Street, NW, Washington, DC 20401-0001.

Title 16, Code of Federal Regulations, Part 1632, "Standard for the Flammability of Mattresses and Mattress Pads" (FF 4-72).

2.3.13 Other Publication.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

▲ 2.4 References for Extracts in Mandatory Sections.

NFPA 1, *Fire Code*, 2021 edition.

NFPA 72®, *National Fire Alarm and Signaling Code*®, 2019 edition.

NFPA 80, *Standard for Fire Doors and Other Opening Protectives*, 2019 edition.

NFPA 88A, *Standard for Parking Structures*, 2019 edition.

NFPA 150, *Fire and Life Safety in Animal Housing Facilities Code*, 2019 edition.

NFPA 221, *Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls*, 2021 edition.

NFPA 252, *Standard Methods of Fire Tests of Door Assemblies*, 2017 edition.

NFPA 288, *Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance-Rated Assemblies*, 2017 edition.

NFPA 301, *Code for Safety to Life from Fire on Merchant Vessels*, 2018 edition.

NFPA 400, *Hazardous Materials Code*, 2019 edition.

NFPA 415, *Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways*, 2016 edition.

NFPA 703, *Standard for Fire-Retardant-Treated Wood and Fire-Retardant Coatings for Building Materials*, 2021 edition.

NFPA 921, *Guide for Fire and Explosion Investigations*, 2021 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2021 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this *Code*. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3* Code. A standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law independently of other codes and standards.

3.2.4 Labeled. Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

3.2.5* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.6 Shall. Indicates a mandatory requirement.

3.2.7 Should. Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1 Accessible Area of Refuge. See 3.3.23.1.

3.3.2 Accessible Means of Egress. See 3.3.180.1.

▲ **3.3.3 Accessible Route.** A continuous unobstructed path that complies with this *Code* and ICC A117.1, *Accessible and Usable Buildings and Facilities*. (SAF-MEA)

3.3.4* Actuating Member or Bar. The activating mechanism of a panic hardware or fire exit hardware device located on the egress side of a door. (SAF-MEA)

3.3.5 Addition. An increase in building area, aggregate floor area, building height, or number of stories of a structure. (SAF-FUN)

3.3.6 Airport Traffic Control Tower. See 3.3.293.1.

3.3.7 Aircraft Loading Walkway. An aboveground device through which passengers move between a point in an airport terminal building and an aircraft. Included in this category are walkways that are essentially fixed and permanently placed, or walkways that are essentially mobile in nature and that fold, telescope, or pivot from a fixed point at the airport terminal building. [415, 2016] (SAF-AXM)

3.3.8 Air-Inflated Structure. See 3.3.284.1.

3.3.9 Airport Terminal Building. See 3.3.37.1.

3.3.10 Air-Supported Structure. See 3.3.284.2.

3.3.11* Aisle Accessway. The initial portion of an exit access that leads to an aisle. (SAF-AXM)

3.3.12 Aisle Ramp. See 3.3.231.1.

3.3.13 Aisle Stair. See 3.3.277.1.

3.3.14 Alarm.

3.3.14.1 Single-Station Alarm. A detector comprising an assembly that incorporates a sensor, control components, and an alarm notification appliance in one unit operated from a power source either located in the unit or obtained at the point of installation. [72, 2019] (SAF-BSF)

3.3.14.2 Smoke Alarm. A single or multiple-station alarm responsive to smoke. [72, 2019] (SAF-BSF)

3.3.15 Alternative Calculation Procedure. A calculation procedure that differs from the procedure originally employed by the design team but that provides predictions for the same variables of interest. (SAF-FUN)

3.3.16 Ambulatory Health Care Occupancy. See 3.3.198.1.

3.3.17 Analysis.

3.3.17.1 Sensitivity Analysis. An analysis performed to determine the degree to which a predicted output will vary given a specified change in an input parameter, usually in relation to models. (SAF-FUN)

3.3.17.2 Uncertainty Analysis. An analysis performed to determine the degree to which a predicted value will vary. (SAF-FUN)

3.3.18 Anchor Building. See 3.3.37.2.

3.3.19* Animal Housing Facility. Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. [150, 2016] (SAF-FUN)

3.3.20 Apartment Building. See 3.3.37.3.

3.3.21 Approved Existing. See 3.3.84.1.

3.3.22 Area.

3.3.22.1 Detention and Correctional Residential Housing Area. Sleeping areas and any contiguous day room, group activity space, or other common space for customary access of residents. (SAF-DET)

3.3.22.2 Floor Area.

N 3.3.22.2.1* Clear Floor Area. Floor area that is accessible and unobstructed. (SAF-MEA)

3.3.22.2.2* Gross Floor Area. The floor area within the inside perimeter of the outside walls, or the outside walls and fire walls of a building, or outside and/or inside walls that bound an occupancy or incidental use area with no deductions for hallways, stairs, closets, thickness of interior walls, columns, elevator and building services shafts, or other features, but excluding floor openings associated with atriums and communicating spaces. (SAF-MEA)

N 3.3.22.2.3* Gross Floor Area (Health Care and Ambulatory Health Care Occupancies). For determining the areas of smoke compartments in health care and ambulatory health care occupancies and determining the areas of health care suites, the floor area within the inside perimeter of the outside walls, or the outside walls and fire walls of a building, or outside and/or inside walls that bound an occupancy or incidental use area with no deductions for hallways, closets, thickness of interior walls, columns, or other features, but excluding floor openings associated with atriums and communicating spaces. (SAF-HEA)

Δ 3.3.22.2.4 Net Floor Area. The floor area within the inside perimeter of the outside walls, or the outside walls and fire walls of a building, or outside and/or inside walls that bound an occupancy or incidental use area with deductions for hallways, stairs, closets, shafts, thickness of interior walls, columns, and other features. (SAF-MEA)

3.3.22.3 Gross Leasable Area. Fifty percent of major tenant areas, and 100 percent of all other floor areas designated for tenant occupancy and exclusive use, including storage areas. The area of tenant occupancy is measured from the centerlines of joint partitions to the outside of the tenant walls. (SAF-MER)

3.3.22.4* Hazardous Area. An area of a structure or building that poses a degree of hazard greater than that normal to the general occupancy of the building or structure. (SAF-FIR)

3.3.22.5 Living Area. Any normally occupiable space in a residential occupancy, other than sleeping rooms or rooms that are intended for combination sleeping/living, bathrooms, toilet compartments, kitchens, closets, halls, storage or utility spaces, and similar areas. (SAF-RES)

3.3.22.6* Normally Unoccupied Building Service Equipment Support Area. A building service equipment support area in which people are not expected to be present on a regular basis. (SAF-MEA)

3.3.22.7 Occupiable Area. An area of a facility occupied by people on a regular basis. (SAF-FUN)

3.3.22.8 Rehabilitation Work Area. That portion of a building affected by any renovation, modification, or reconstruction work as initially intended by the owner, and indicated

as such in the permit, but excluding other portions of the building where incidental work entailed by the intended work must be performed, and excluding portions of the building where work not initially intended by the owner is specifically required. (SAF-FUN)

3.3.23* Area of Refuge. An area that is either (1) a story in a building where the building is protected throughout by an approved, supervised automatic sprinkler system and has not less than two accessible rooms or spaces separated from each other by smoke-resisting partitions; or (2) a space located in a path of travel leading to a public way that is protected from the effects of fire, either by means of separation from other spaces in the same building or by virtue of location, thereby permitting a delay in egress travel from any level. (SAF-MEA)

△ **3.3.23.1 Accessible Area of Refuge.** An area of refuge that complies with the accessible route requirements of ICC A117.1, *Accessible and Usable Buildings and Facilities*. (SAF-MEA)

3.3.24 Assembly.

3.3.24.1 Door Assembly. Any combination of a door, frame, hardware, and other accessories that is placed in an opening in a wall that is intended primarily for access or for human entrance or exit. [252, 2017] (SAF-MEA)

3.3.24.1.1 Fire Door Assembly. Any combination of a fire door, a frame, hardware, and other accessories that together provide a specific degree of fire protection to the opening. [80, 2019] (SAF-FIR)

3.3.24.1.1.1 Horizontal Fire Door Assembly. A combination of a fire door, a frame, hardware, and other accessories installed in a horizontal plane, which together provide a specific degree of fire protection to a through-opening in a fire resistance-rated floor or roof. [288, 2017] (SAF-FIR)

3.3.24.2 Fire Window Assembly. A window or glass block assembly having a fire protection rating. [80, 2019] (SAF-FIR)

3.3.25 Assembly Occupancy. See 3.3.198.2.

3.3.26 Assisted Mechanical Type Parking Structure. See 3.3.284.8.1.

3.3.27 Atmosphere.

3.3.27.1 Common Atmosphere. The atmosphere that exists between rooms, spaces, or areas within a building that are not separated by an approved smoke barrier. (SAF-END)

3.3.27.2 Separate Atmosphere. The atmosphere that exists between rooms, spaces, or areas that are separated by an approved smoke barrier. (SAF-END)

3.3.28* Atrium. A large-volume space created by a floor opening or series of floor openings connecting two or more stories that is covered at the top of the series of openings and is used for purposes other than an enclosed stairway; an elevator hoistway; an escalator opening; or as a utility shaft used for plumbing, electrical, air-conditioning, or communications facilities. (SAF-FIR)

3.3.29* Attic. The space located between the ceiling of a story and the roof directly above that habitable story. (SAF-FUN)

3.3.30 Automated Type Parking Structure. See 3.3.284.8.2.

3.3.31 Automatic. Capable of performing a function without the necessity of human intervention. (SAF-FUN)

3.3.32 Barrier.

3.3.32.1* Fire Barrier. A continuous membrane or a membrane with discontinuities created by protected openings with a specified fire protection rating, where such membrane is designed and constructed with a specified fire resistance rating to limit the spread of fire. (SAF-FIR)

3.3.32.2* Smoke Barrier. A continuous membrane, or a membrane with discontinuities created by protected openings, where such membrane is designed and constructed to restrict the movement of smoke. (SAF-FIR)

△ **3.3.32.3* Thermal Barrier.** A material that limits the average temperature rise of an unexposed surface to not more than 250°F (139°C) for a specified fire exposure complying with the standard time-temperature curve of ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, or UL 263, *Fire Tests of Building Construction and Materials*. (SAF-BCF)

3.3.33 Basement. Any story of a building wholly or partly below grade plane that is not considered the first story above grade plane. (See also 3.3.130.1, *First Story Above Grade Plane*.) (SAF-FUN)

3.3.34* Birth Center. A facility in which low-risk births are expected following normal, uncomplicated pregnancies, and in which professional midwifery care is provided to women during pregnancy, birth, and postpartum. (SAF-MER)

3.3.35 Bleachers. A grandstand in which the seats are not provided with backrests. (SAF-AXM)

3.3.36 Board and Care. See 3.3.198.12, *Residential Board and Care Occupancy*.

3.3.37* Building. Any structure used or intended for supporting or sheltering any use or occupancy. (SAF-FUN)

3.3.37.1 Airport Terminal Building. A structure used primarily for air passenger enplaning or deplaning, including ticket sales, flight information, baggage handling, and other necessary functions in connection with air transport operations. This term includes any extensions and satellite buildings used for passenger handling or aircraft flight service functions. Aircraft loading walkways and “mobile lounges” are excluded. [415, 2016] (SAF-AXM)

3.3.37.2 Anchor Building. A building housing any occupancy having low or ordinary hazard contents and having direct access to a mall structure, but having all required means of egress independent of the mall concourse. (SAF-MER)

3.3.37.3* Apartment Building. A building or portion thereof containing three or more dwelling units with independent cooking and bathroom facilities. (SAF-RES)

3.3.37.4 Bulk Merchandising Retail Building. A building in which the sales area includes the storage of combustible materials on pallets, in solid piles, or in racks in excess of 12 ft (3660 mm) in storage height. (SAF-MER)

3.3.37.5* Existing Building. A building erected or officially authorized prior to the effective date of the adoption of this edition of the *Code* by the agency or jurisdiction. (SAF-FUN)

3.3.37.6* Flexible Plan and Open Plan Educational or Day-Care Building. A building or portion of a building designed for multiple teaching stations. (SAF-END)

3.3.37.7* High-Rise Building. A building where the floor of an occupiable story is greater than 75 ft (23 m) above the lowest level of fire department vehicle access. (SAF-FUN)

3.3.37.8* Historic Building. A building or facility deemed to have historical, architectural, or cultural significance by a local, regional, or national jurisdiction. (SAF-FUN)

3.3.37.9* Special Amusement Building. A building or portion thereof that is temporary, permanent, or mobile and contains a ride or device that conveys patrons where the patrons can be contained or restrained, or provides a walkway along, around, or over a course in any direction as a form of amusement or entertainment, and arranged so that the egress path is not readily apparent due to visual or audio distractions, contains an intentionally confounded egress path, or is not readily available due to the mode of conveyance through the building or structure. (SAF-AXM)

3.3.38* Building Code. The building code enforced by the jurisdiction or agency enforcing this Code. (SAF-FUN)

3.3.39 Bulk Merchandising Retail Building. See 3.3.37.4.

3.3.40 Business Occupancy. See 3.3.198.3.

3.3.41 Categories of Rehabilitation Work. The nature and extent of rehabilitation work undertaken in an existing building. (SAF-FUN)

3.3.42* Cellular or Foamed Plastic. A heterogeneous system comprised of not less than two phases, one of which is a continuous, polymeric, organic material, and the second of which is deliberately introduced for the purpose of distributing gas in voids throughout the material. (SAF-INT)

3.3.43 Change of Occupancy Classification. The change in the occupancy classification of a structure or portion of a structure. (SAF-FUN)

3.3.44 Change of Use. A change in the purpose or level of activity within a structure that involves a change in application of the requirements of the Code. (SAF-FUN)

3.3.45 Combustible (Material). See 3.3.179.1.

3.3.46 Combustion. A chemical process of oxidation that occurs at a rate fast enough to produce heat and usually light in the form of either a glow or flame. (SAF-FUN)

3.3.47 Common Atmosphere. See 3.3.27.1.

3.3.48* Common Path of Travel. The portion of exit access that must be traversed before two separate and distinct paths of travel to two exits are available. (SAF-MEA)

3.3.49 Compartment.

3.3.49.1* Fire Compartment. A space within a building that is enclosed by fire barriers on all sides, including the top and bottom. (SAF-FIR)

3.3.49.2* Smoke Compartment. A space within a building enclosed by smoke barriers on all sides, including the top and bottom. (SAF-FIR)

3.3.50 Contents and Furnishings. Any movable objects in a building or adjacent to a building that normally are secured or

otherwise put in place for functional reasons, excluding parts of the internal structure of the building and any items meeting the definition of *interior finish*. (SAF-INT)

3.3.51 Court. An open, uncovered, unoccupied space, unobstructed to the sky, bounded on three or more sides by exterior building walls. (SAF-MEA)

3.3.51.1 Enclosed Court. A court bounded on all sides by the exterior walls of a building or by the exterior walls and lot lines on which walls are permitted. (SAF-MEA)

3.3.51.2 Food Court. A public seating area located in a mall concourse that serves adjacent food preparation tenant spaces. (SAF-MER)

3.3.52* Critical Radiant Flux. The level of incident radiant heat energy in units of W/cm² on a floor-covering system at the most distant flameout point. (SAF-INT)

3.3.53 Data Conversion. The process of developing the input data set for the assessment method of choice. (SAF-FUN)

3.3.54 Day-Care Home. See 3.3.150.1.

3.3.55 Day-Care Occupancy. See 3.3.198.4.

3.3.56 Deep-Fat Frying. A cooking method that involves fully immersing food in hot oil. (SAF-HEA)

3.3.57 Delayed Action Closer. Mechanical self-closing device that incorporates an adjustable delay prior to the initiation of closing. (SAF-MEA)

3.3.58 Design Fire Scenario. See 3.3.107.1.

3.3.59 Design Specification. See 3.3.274.1.

3.3.60 Design Team. A group of stakeholders including, but not limited to, representatives of the architect, client, and any pertinent engineers and other designers. (SAF-FUN)

3.3.61 Detention and Correctional Occupancy. See 3.3.198.5.

3.3.62 Detention and Correctional Residential Housing Area. See 3.3.22.1.

3.3.63 Device.

3.3.63.1* Emergency Stair Travel Device. Device designed and constructed to facilitate travel over interior floor surfaces, interior and exterior stairs, and exterior accessible pathways. (SAF-MEA)

3.3.63.2 Multiple-Station Alarm Device. Two or more single-station alarm devices that can be interconnected so that actuation of one causes all integral or separate audible alarms to operate; or one single-station alarm device having connections to other detectors or to a manual fire alarm box. [72, 2019] (SAF-BSF)

3.3.64 Door.

3.3.64.1 Elevator Lobby Door. A door between an elevator lobby and another building space other than the elevator shaft. (SAF-MEA)

3.3.64.2 Fire Door. The door component of a fire door assembly. (SAF-FIR)

3.3.65 Door Assembly. See 3.3.24.1.

3.3.66* Dormitory. A building or a space in a building in which group sleeping accommodations are provided for more than 16 persons who are not members of the same family in one room, or a series of closely associated rooms, under joint occupancy and single management, with or without meals, but without individual cooking facilities. (SAF-RES)

3.3.67 Draft Stop. A continuous membrane used to subdivide a concealed space to resist the passage of smoke and heat. (SAF-FIR)

3.3.68* Dwelling Unit. One or more rooms arranged for complete, independent housekeeping purposes with space for eating, living, and sleeping; facilities for cooking; and provisions for sanitation. (SAF-RES)

3.3.68.1* One- and Two-Family Dwelling Unit. A building that contains not more than two dwelling units, each dwelling unit occupied by members of a single family with not more than three outsiders, if any, accommodated in rented rooms. (SAF-RES)

3.3.68.2 One-Family Dwelling Unit. A building that consists solely of one dwelling unit with independent cooking and bathroom facilities. (SAF-RES)

3.3.68.3 Two-Family Dwelling Unit. A building that consists solely of two dwelling units with independent cooking and bathroom facilities. (SAF-RES)

3.3.69 Educational Occupancy. See 3.3.198.6.

3.3.70* Electroluminescent. Refers to a light-emitting capacitor in which alternating current excites phosphor atoms placed between electrically conductive surfaces and produces light. (SAF-MEA)

3.3.71 Elevator Evacuation System. See 3.3.285.1.

3.3.72 Elevator Lobby. A landing from which occupants directly enter an elevator car(s) and into which occupants directly enter upon leaving an elevator car(s). (SAF-MEA)

3.3.73 Elevator Lobby Door. See 3.3.64.1.

3.3.74 Emergency Control Functions. Building, fire, and emergency control elements or systems that are initiated by the fire alarm or signaling system and either increase the level of life safety for occupants or control the spread of the harmful effects of fire or other dangerous products. [72, 2019] (SAF-BSF)

3.3.75 Emergency Stair Travel Device. See 3.3.64.1.

3.3.76 Enclosed Court. See 3.3.51.1.

3.3.77 Enclosed Parking Structure. See 3.3.284.8.3.

3.3.78 Equipment or Fixture. Any plumbing, heating, electrical, ventilating, air-conditioning, refrigerating, and fire protection equipment; and elevators, dumbwaiters, escalators, boilers, pressure vessels, or other mechanical facilities or installations that are related to building services. (SAF-FUN)

3.3.79 Equivalency. An alternative means of providing an equal or greater degree of safety than that afforded by strict conformance to prescribed codes and standards. (SAF-FUN)

3.3.80 Evacuation. The withdrawal of occupants from a building. [72, 2019] (SAF-BSF)

3.3.81* Evacuation Capability. The ability of occupants, residents, and staff as a group either to evacuate a building or to relocate from the point of occupancy to a point of safety.

3.3.81.1 Impractical Evacuation Capability. The inability of a group to reliably move to a point of safety in a timely manner. (SAF-BCF)

3.3.81.2 Prompt Evacuation Capability. The ability of a group to move reliably to a point of safety in a timely manner that is equivalent to the capacity of a household in the general population. (SAF-BCF)

3.3.81.3 Slow Evacuation Capability. The ability of a group to move reliably to a point of safety in a timely manner, but not as rapidly as members of a household in the general population. (SAF-BCF)

3.3.82 Exhibit. A space or portable structure used for the display of products or services. (SAF-AXM)

3.3.83 Exhibitor. An individual or entity engaged in the display of the products or services offered. (SAF-AXM)

3.3.84* Existing. That which is already in existence on the date this edition of the *Code* goes into effect. (SAF-FUN)

3.3.84.1 Approved Existing. That which is already in existence on the date this edition of the *Code* goes into effect and is acceptable to the authority having jurisdiction. (SAF-FUN)

3.3.85 Existing Building. See 3.3.37.5.

3.3.86* Exit. That portion of a means of egress that is separated from all other spaces of the building or structure by construction, location, or equipment as required to provide a protected way of travel to the exit discharge. (SAF-MEA)

3.3.86.1* Horizontal Exit. A way of passage from one building to an area of refuge in another building on approximately the same level, or a way of passage through or around a fire barrier to an area of refuge on approximately the same level in the same building that affords safety from fire and smoke originating from the area of incidence and areas communicating therewith. (SAF-MEA)

3.3.87 Exit Access. That portion of a means of egress that leads to an exit. (SAF-MEA)

3.3.88 Exit Discharge. That portion of a means of egress between the termination of an exit and a public way. (SAF-MEA)

3.3.88.1* Level of Exit Discharge. The story that is either (1) the lowest story from which not less than 50 percent of the required number of exits and not less than 50 percent of the required egress capacity from such a story discharge directly outside at the finished ground level; or (2) where no story meets the conditions of item (1), the story that is provided with one or more exits that discharge directly to the outside to the finished ground level via the smallest elevation change. (SAF-MEA)

3.3.89 Exposition. An event in which the display of products or services is organized to bring together the provider and user of the products or services. (SAF-AXM)

3.3.90 Exposition Facility. See 3.3.93.1.

3.3.91* Exposure Fire. A fire that starts at a location that is remote from the area being protected and grows to expose that which is being protected. (SAF-FUN)

3.3.92 Externally Illuminated. See 3.3.154.1.

3.3.93 Facility.

3.3.93.1 Exposition Facility. A convention center, hotel, or other building at which exposition events are held. (SAF-AXM)

3.3.93.2* Limited Care Facility. A building or portion of a building used on a 24-hour basis for the housing of four or more persons who are incapable of self-preservation because of age; physical limitations due to accident or illness; or limitations such as intellectual disability/developmental disability, mental illness, or chemical dependency. (SAF-HEA)

3.3.94 Festival Seating. See 3.3.250.1.

3.3.95 Finish.

3.3.95.1 Interior Ceiling Finish. The interior finish of ceilings. (SAF-INT)

3.3.95.2* Interior Finish. The exposed surfaces of walls, ceilings, and floors within buildings. (SAF-INT)

3.3.95.3* Interior Floor Finish. The interior finish of floors, ramps, stair treads and risers, and other walking surfaces. (SAF-INT)

3.3.95.4* Interior Wall Finish. The interior finish of columns, fixed or movable walls, and fixed or movable partitions. (SAF-INT)

3.3.96 Finished Ground Level (Grade). The level of the finished ground (earth or other surface on ground). (See also 3.3.130, *Grade Plane*.) (SAF-FUN)

3.3.97 Fire Barrier. See 3.3.32.1.

3.3.98 Fire Barrier Wall. See 3.3.302.1.

3.3.99* Fire Code. The fire code enforced by the jurisdiction or agency enforcing this *Code*. (SAF-FUN)

3.3.100 Fire Compartment. See 3.3.49.1.

3.3.101 Fire Door. See 3.3.64.2.

3.3.102 Fire Door Assembly. See 3.3.24.1.1.

3.3.103 Fire Exit Hardware. See 3.3.139.1.

3.3.104* Fire Model. A structured approach to predicting one or more effects of a fire. (SAF-FUN)

3.3.105 Fire Protection Rating. See 3.3.233.1.

3.3.106 Fire Resistance Rating. See 3.3.233.2.

3.3.107* Fire Scenario. A set of conditions that defines the development of fire, the spread of combustion products throughout a building or portion of a building, the reactions of people to fire, and the effects of combustion products. (SAF-FUN)

3.3.107.1 Design Fire Scenario. A fire scenario selected for evaluation of a proposed design. (SAF-FUN)

△ 3.3.108 Fire Watch. The assignment of a person or persons to an area for the express purpose of notifying the fire department, the building occupants, or both of an emergency; preventing a fire from occurring; extinguishing small fires; protecting the public from fire or life safety dangers. [1, 2021] (SAF-BSF)

3.3.109 Fire Window Assembly. See 3.3.24.2.

3.3.110 Fire-Rated Glazing. Glazing with either a fire protection rating or a fire resistance rating. (SAF-FIR)

3.3.111 Fire-Retardant-Treated Wood. A wood product impregnated with chemical by a pressure process or other means during manufacture, treated to exhibit reduced surface-burning characteristics and resist propagation of fire. [703, 2018] (SAF-FUN)

N 3.3.112 Fire-Retardant Coating. A coating that reduces the flame spread index of Douglas fir, or of any other tested combustible surface to which it is applied, when tested in accordance with a test for assessing surface burning characteristics. [703, 2018] (SAF-INT)

3.3.113 First Story Above Grade Plane. See 3.3.130.1.

3.3.114 Fixed Seating. See 3.3.250.2.

3.3.115* Flame Spread. The propagation of flame over a surface. (SAF-INT)

3.3.116 Flame Spread Index. See 3.3.157.1.

N 3.3.117 Flaming Droplets. Liquefied material that separates and drips from the test specimen during the fire test and continues to burn with flame. (SAF-INT)

3.3.118 Flashover. A stage in the development of a contained fire in which all exposed surfaces reach ignition temperature more or less simultaneously and fire spreads rapidly throughout the space. (SAF-INT)

3.3.119 Flexible Plan and Open Plan Educational or Day-Care Building. See 3.3.37.6.

3.3.120 Floor Fire Door Assembly. See 3.3.24.1.1.1.

3.3.121 Flow Time. A component of total evacuation time that is the time during which there is crowd flow past a point in the means of egress system. (SAF-AXM)

3.3.122 Fly Gallery. A raised floor area above a stage from which the movement of scenery and operation of other stage effects are controlled. (SAF-AXM)

3.3.123 Foam Plastic Insulation. See 3.3.160.1.

3.3.124 Folding and Telescopic Seating. See 3.3.250.3.

3.3.125 Food Court. See 3.3.51.2.

3.3.126 Fuel Load. See 3.3.172.1.

3.3.127 General Industrial Occupancy. See 3.3.198.8.1.

3.3.128 Goal. A nonspecific overall outcome to be achieved that is measured on a qualitative basis. (SAF-FUN)

3.3.129 Grade. See 3.3.96, Finished Ground Level (Grade).

3.3.130* Grade Plane. A reference plane upon which vertical measurements of a building are based representing the average

of the finished ground level adjoining the building at all exterior walls. (SAF-FUN)

3.3.130.1 First Story Above Grade Plane. Any story having its finished floor surface entirely above grade plane, except that a basement is to be considered as a first story above grade plane where the finished surface of the floor above the basement is (1) more than 6 ft (1830 mm) above grade plane or (2) more than 12 ft (3660 mm) above the finished ground level at any point. (SAF-FUN)

3.3.131* Grandstand. A structure that provides tiered or stepped seating. (SAF-AXM)

3.3.132 Gridiron. The structural framing over a stage supporting equipment for hanging or flying scenery and other stage effects. (SAF-AXM)

3.3.133 Gross Floor Area. See 3.3.22.2.2.

3.3.134 Gross Leasable Area. See 3.3.22.3.

3.3.135 Guard. A vertical protective barrier erected along exposed edges of stairways, balconies, and similar areas. (SAF-MEA)

3.3.136 Guest Room. An accommodation combining living, sleeping, sanitary, and storage facilities within a compartment. (SAF-RES)

3.3.137 Guest Suite. See 3.3.285.1.

3.3.138 Handrail. A bar, pipe, or similar member designed to furnish persons with a handhold. (SAF-MEA)

3.3.139 Hardware.

3.3.139.1 Fire Exit Hardware. A type of panic hardware that additionally provides fire protection where used as part of a fire door assembly. (SAF-MEA)

3.3.139.2 Panic Hardware. A door-latching assembly incorporating an actuating member or bar that releases the latch bolt upon the application of a force in the direction of egress travel. (SAF-MEA)

3.3.140 Hazard Material. See 3.3.179.2.

3.3.141 Hazardous Area. See 3.3.22.4.

3.3.142 Hazardous Material. See 3.3.179.3.

3.3.143 Health Care Occupancy. See 3.3.198.7.

3.3.144 Health Hazard Material. See 3.3.179.2.1.

3.3.145* Heat Release Rate (HRR). The rate at which heat energy is generated by burning. [921, 2017] (SAF-INT)

3.3.146 High Hazard Industrial Occupancy. See 3.3.198.8.2.

3.3.147 Highly Toxic Material. See 3.3.179.7.1.

3.3.148 High-Rise Building. See 3.3.37.7.

3.3.149 Historic Building. See 3.3.37.8.

3.3.150 Home.

3.3.150.1* Day-Care Home. A building or portion of a building in which more than 3 but not more than 12 clients receive care, maintenance, and supervision, by other than their relative(s) or legal guardians(s), for less than 24 hours per day. (SAF-END)

3.3.150.2 Nursing Home. A building or portion of a building used on a 24-hour basis for the housing and nursing care of four or more persons who, because of mental or physical incapacity, might be unable to provide for their own needs and safety without the assistance of another person. (SAF-HEA)

3.3.151 Horizontal Exit. See 3.3.86.1.

3.3.152 Hospital. A building or portion thereof used on a 24-hour basis for the medical, psychiatric, obstetrical, or surgical care of four or more inpatients. (SAF-HEA)

3.3.153* Hotel. A building or groups of buildings under the same management in which there are sleeping accommodations for more than 16 persons and primarily used by transients for lodging with or without meals. (SAF-RES)

3.3.154 Illuminated.

3.3.154.1* Externally Illuminated. Refers to an illumination source that is contained outside of the device or sign legend area that is to be illuminated. (SAF-MEA)

3.3.154.2* Internally Illuminated. Refers to an illumination source that is contained inside the device or legend that is illuminated. (SAF-MEA)

3.3.155 Impractical Evacuation Capability. See 3.3.81.1.

3.3.156 Incapacitation. A condition under which humans do not function adequately and become unable to escape untenable conditions. (SAF-FUN)

3.3.157 Index.

▲ **3.3.157.1 Flame Spread Index.** A comparative measure, expressed as a dimensionless number, derived from visual measurements of the spread of flame versus time for a material tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or UL 723, *Test for Surface Burning Characteristics of Building Materials*. (SAF-INT)

▲ **3.3.157.2 Smoke Developed Index.** A comparative measure, expressed as a dimensionless number, derived from measurements of smoke obscuration versus time for a material tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or UL 723, *Test for Surface Burning Characteristics of Building Materials*. (SAF-INT)

3.3.158 Industrial Occupancy. See 3.3.198.8.

3.3.159 Input Data Specification. See 3.3.274.2.

3.3.160 Insulation.

3.3.160.1 Foam Plastic Insulation. A cellular plastic, used for thermal insulating or acoustical applications, having a density of 20 lb/ft³ (320 kg/m³) or less, containing open or closed cells, and formed by a foaming agent. (SAF-INT)

3.3.160.2 Reflective Insulation. Thermal insulation consisting of one or more low-emittance surfaces bounding one or more enclosed air spaces. (SAF-INT)

3.3.161 Interior Ceiling Finish. See 3.3.95.1.

3.3.162 Interior Finish. See 3.3.95.2.

3.3.163 Interior Floor Finish. See 3.3.95.3.

3.3.164 Interior Wall Finish. See 3.3.95.4.

3.3.165 Internally Illuminated. See 3.3.154.2.

3.3.166 Joint. A linear opening in or between adjacent assemblies that is designed to allow independent movement of the building. (SAF-FIR)

3.3.167 Level of Exit Discharge. See 3.3.88.1.

3.3.168 Life Safety Evaluation. A written review dealing with the adequacy of life safety features relative to fire, storm, collapse, crowd behavior, and other related safety considerations. (SAF-AXM)

3.3.169 Limited Access Structure. See 3.3.284.3.

3.3.170 Limited Care Facility. See 3.3.93.2.

3.3.171 Living Area. See 3.3.22.5.

3.3.172 Load.

3.3.172.1* Fuel Load. The total quantity of combustible contents of a building, space, or fire area. (SAF-FUN)

3.3.172.2 Occupant Load. The total number of persons that might occupy a building or portion thereof at any one time. (SAF-MEA)

3.3.173 Load-Bearing Element. Any column, girder, beam, joist, truss, rafter, wall, floor, or roof sheathing that supports any vertical load in addition to its own weight, or any lateral load. (SAF-FIR)

3.3.174 Lock-Up. An incidental use area in other than a detention and correctional occupancy where occupants are restrained and such occupants are mostly incapable of self-preservation because of security measures not under the occupants' control. (SAF-DET)

3.3.175 Lodging or Rooming House. A building or portion thereof that does not qualify as a one- or two-family dwelling, that provides sleeping accommodations for a total of 16 or fewer people on a transient or permanent basis, without personal care services, with or without meals, but without separate cooking facilities for individual occupants. (SAF-RES)

3.3.176 Major Tenant. A tenant space, in a mall structure, with one or more main entrances from the exterior that also serve as exits and are independent of the mall concourse. (SAF-MER)

3.3.177 Mall Concourse. A common pedestrian area within a mall structure that serves as access for two or more tenants and does not exceed three levels that are open to each other. (SAF-MER)

3.3.177.1* Open Mall Concourse. A mall concourse that either (1) has 50 percent or more of the total area of the solid mall concourse perimeter walls and solid roof area open to the atmosphere with openings distributed uniformly over the length of the mall concourse, or (2) has an approved open mall concourse engineering analysis.

3.3.177.2 Enclosed Mall Concourse. A mall concourse that does not meet the definition of open mall concourse.

3.3.178 Mall Structure. See 3.3.284.4.

3.3.179 Material.

3.3.179.1 Combustible (Material). A material that, in the form in which it is used and under the conditions anticipated, will ignite and burn; a material that does not meet the definition of noncombustible or limited-combustible. (SAF-FUN)

3.3.179.2 Hazard Material.

3.3.179.2.1 Health Hazard Material. A chemical or substance classified as a toxic, highly toxic, or corrosive material in accordance with definitions set forth in this code. [5000, 2021] (SAF-IND)

3.3.179.2.2 Physical Hazard Material. A chemical or substance classified as a combustible liquid, explosive, flammable cryogen, flammable gas, flammable liquid, flammable solid, organic peroxide, oxidizer, oxidizing cryogen, pyrophoric, unstable (reactive), or water-reactive material. [400, 2019] (SAF-IND)

3.3.179.3 Hazardous Material. A chemical or substance that is classified as a physical hazard material or a health hazard material, whether the chemical or substance is in usable or waste condition. [400, 2019] (SAF-IND)

3.3.179.4 Limited-Combustible (Material). See 4.6.14.

3.3.179.5 Metal Composite Material (MCM). A factory-manufactured panel consisting of metal skins bonded to both faces of a core made of any plastic other than foamed plastic insulation as defined in 3.3.160.1. (SAF-MER)

3.3.179.6 Noncombustible (Material). See 4.6.13.

3.3.179.7 Toxic Material. A material that produces a lethal dose or a lethal concentration within any of the following categories: (1) a chemical or substance that has a median lethal dose (LD₅₀) of more than 50 mg/kg but not more than 500 mg/kg of body weight when administered orally to albino rats weighing between 200 g and 300 g each; (2) a chemical or substance that has a median lethal dose (LD₅₀) of more than 200 mg/kg but not more than 1000 mg/kg of body weight when administered by continuous contact for 24 hours, or less if death occurs within 24 hours, with the bare skin of albino rabbits weighing between 2 kg and 3 kg each, or albino rats weighing 200 g to 300 g each; (3) a chemical or substance that has a median lethal concentration (LC₅₀) in air of more than 200 parts per million but not more than 2000 parts per million by volume of gas or vapor, or more than 2 mg/L but not more than 20 mg/L, of mist, fume, or dust when administered by continuous inhalation for 1 hour, or less if death occurs within 1 hour, to albino rats weighing between 200 g and 300 g each. [5000, 2021] (SAF-IND)

3.3.179.7.1 Highly Toxic Material. A material that produces a lethal dose or lethal concentration that falls within any of the following categories: (1) a chemical that has a median lethal dose (LD₅₀) of 50 mg/kg or less of body weight when administered orally to albino rats weighing between 200 g and 300 g each; (2) a chemical that has a median lethal dose (LD₅₀) of 200 mg/kg or less of body weight when administered by continuous contact for 24 hours, or less if death occurs within 24 hours, with the bare skin of albino rabbits weighing between 2 kg and 3 kg each or albino rats weighing 200 g to 300 g each; (3) a chemical that has a

median lethal concentration (LC_{50}) in air of 200 parts per million by volume or less of gas or vapor, or 2 mg/L or less of mist, fume, or dust, when administered by continuous inhalation for 1 hour, or less if death occurs within 1 hour, to albino rats weighing between 200 g and 300 g each. [400, 2019] (SAF-IND)

3.3.179.8 Weathered-Membrane Material. Membrane material that has been subjected to a minimum of 3000 hours in a weatherometer in accordance with ASTM G155, *Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials*, or approved equivalent. (SAF-IND)

3.3.180* Means of Egress. A continuous and unobstructed way of travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (1) the exit access, (2) the exit, and (3) the exit discharge. (SAF-MEA)

3.3.180.1 Accessible Means of Egress. A means of egress that provides an accessible route to an area of refuge, a horizontal exit, or a public way. (SAF-MEA)

3.3.181 Means of Escape. A way out of a building or structure that does not conform to the strict definition of means of egress but does provide an alternate way out. (SAF-MEA)

3.3.182* Membrane. A thin layer of construction material. (SAF-FIR)

3.3.183 Membrane Structure. See 3.3.284.5.

3.3.184 Mercantile Occupancy. See 3.3.198.9.

3.3.185 Metal Composite Material (MCM). See 3.3.179.5.

3.3.186 Mezzanine. An intermediate level between the floor and the ceiling of any room or space. (SAF-FIR)

3.3.187 Mixed Occupancy. See 3.3.198.10.

3.3.188* Modification. The reconfiguration of any space; the addition or elimination of any door or window; the addition or elimination of load-bearing elements; the reconfiguration or extension of any system; or the installation of any additional equipment. (SAF-FUN)

3.3.189 Multilevel Play Structure. See 3.3.284.6.

3.3.190 Multiple Occupancy. See 3.3.198.11.

3.3.191 Multiple Station Alarm Device. See 3.3.63.2.

3.3.192 Multipurpose Assembly Occupancy. See 3.3.198.2.1.

3.3.193 Net Floor Area. See 3.3.22.2.4.

3.3.194 Non-Patient-Care Suite (Health Care Occupancies). See 3.3.284.2.

3.3.195 Normally Unoccupied Building Service Equipment Support Area. See 3.3.22.6.

3.3.196 Nursing Home. See 3.3.150.2.

3.3.197* Objective. A requirement that needs to be met to achieve a goal. (SAF-FUN)

3.3.198 Occupancy. The purpose for which a building or other structure, or part thereof, is used or intended to be used. [ASCE/SEI 7:1.2] (SAF-FUN)

3.3.198.1* Ambulatory Health Care Occupancy. An occupancy used to provide services or treatment simultaneously to four or more patients that provides, on an outpatient basis, one or more of the following: (1) treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others; (2) anesthesia that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others; (3) treatment for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others. (SAF-HEA)

3.3.198.2* Assembly Occupancy. An occupancy (1) used for a gathering of 50 or more persons for deliberation, worship, entertainment, eating, drinking, amusement, awaiting transportation, or similar uses; or (2) used as a special amusement building, regardless of occupant load. (SAF-AXM)

3.3.198.2.1 Multipurpose Assembly Occupancy. An assembly room designed to accommodate temporarily any of several possible assembly uses. (SAF-AXM)

3.3.198.3* Business Occupancy. An occupancy used for the transaction of business other than mercantile. (SAF-MER)

3.3.198.4* Day-Care Occupancy. An occupancy in which four or more clients receive care, maintenance, and supervision, by other than their relatives or legal guardians, for less than 24 hours per day. (SAF-END)

3.3.198.5* Detention and Correctional Occupancy. An occupancy, other than one whose primary intended use is health care, ambulatory health care, or residential board and care, used to lawfully incarcerate or lawfully detain one or more persons under varied degrees of restraint or security where such occupants are mostly incapable of self-preservation because of security measures not under the occupants' control. (SAF-DET)

3.3.198.6* Educational Occupancy. An occupancy used for educational purposes through the twelfth grade by six or more persons for 4 or more hours per day or more than 12 hours per week. (SAF-END)

3.3.198.7* Health Care Occupancy. An occupancy used to provide medical or other treatment or care simultaneously to four or more patients on an inpatient basis, where such patients are mostly incapable of self-preservation due to age, physical or mental disability, or because of security measures not under the occupants' control. (SAF-HEA)

3.3.198.8* Industrial Occupancy. An occupancy in which products are manufactured or in which processing, assembling, mixing, packaging, finishing, decorating, or repair operations are conducted. (SAF-IND)

3.3.198.8.1* General Industrial Occupancy. An industrial occupancy in which ordinary and low hazard industrial operations are conducted in buildings of conventional design suitable for various types of industrial processes. (SAF-IND)

3.3.198.8.2* High Hazard Industrial Occupancy. An industrial occupancy in which industrial operations that include high hazard materials, processes, or contents are conducted. (SAF-IND)

3.3.198.8.3 *Special-Purpose Industrial Occupancy.* An industrial occupancy in which ordinary and low hazard industrial operations are conducted in buildings designed for, and suitable only for, particular types of operations, characterized by a relatively low density of employee population, with much of the area occupied by machinery or equipment. (SAF-IND)

3.3.198.9* *Mercantile Occupancy.* An occupancy used for the display and sale of merchandise. (SAF-MER)

3.3.198.10 *Mixed Occupancy.* A multiple occupancy where the occupancies are intermingled. (SAF-FUN)

3.3.198.11 *Multiple Occupancy.* A building or structure in which two or more classes of occupancy exist. (SAF-FUN)

3.3.198.12* *Residential Board and Care Occupancy.* An occupancy used for lodging and boarding of four or more residents, not related by blood or marriage to the owners or operators, for the purpose of providing personal care services. (SAF-BCF)

3.3.198.13* *Residential Occupancy.* An occupancy that provides sleeping accommodations for purposes other than health care or detention and correctional. (SAF-RES)

3.3.198.14 *Separated Occupancy.* A multiple occupancy where the occupancies are separated by fire resistance-rated assemblies. (SAF-FUN)

3.3.198.15* *Storage Occupancy.* An occupancy used primarily for the storage or sheltering of goods, merchandise, products, or vehicles. (SAF-IND)

3.3.199 *Occupant Characteristics.* The abilities or behaviors of people before and during a fire. (SAF-FUN)

3.3.200 *Occupant Load.* See 3.3.172.2.

3.3.201 *Occupiable Area.* See 3.3.22.7.

3.3.202 *Occupiable Story.* See 3.3.281.1.

3.3.203 *One- and Two-Family Dwelling Unit.* See 3.3.68.1.

3.3.204 *One-Family Dwelling Unit.* See 3.3.68.2.

3.3.205 *Open Parking Structure.* See 3.3.284.8.4.

3.3.206 *Open Structure.* See 3.3.284.7.

3.3.207 *Open-Air Mercantile Operation.* An operation conducted outside of all structures, with the operations area devoid of all walls and roofs except for small, individual, weather canopies. (SAF-MER)

3.3.208 *Outside Stair.* See 3.3.277.2.

3.3.209 *Panic Hardware.* See 3.3.139.2.

3.3.210 *Parking Structure.* See 3.3.284.8.

3.3.211 *Patient Care Nonsleeping Suite (Health Care Occupancies).* See 3.3.285.4.

3.3.212 *Patient Care Sleeping Suite (Health Care Occupancies).* See 3.3.285.5.

3.3.213 *Patient Care Suite (Health Care Occupancies).* See 3.3.285.2.

3.3.214* *Performance Criteria.* Threshold values on measurement scales that are based on quantified performance objectives. (SAF-FUN)

3.3.215 *Permanent Structure.* See 3.3.284.9.

3.3.216* *Personal Care.* The care of residents who do not require chronic, convalescent medical or continuous skilled nursing care. (SAF-BCF)

3.3.217* *Photoluminescent.* Having the ability to store incident electromagnetic radiation typically from ambient light sources, and release it in the form of visible light. [301, 2018] (SAF-MEA)

3.3.218 *Physical Hazard Material.* See 3.3.179.2.2.

3.3.219 *Pinrail.* A rail on or above a stage through which belaying pins are inserted and to which lines are fastened. (SAF-AXM)

3.3.220* *Platform.* The raised area within a building used for the presentation of music, plays, or other entertainment. (SAF-AXM)

3.3.220.1 *Temporary Platform.* A platform erected within an area for not more than 30 days. (SAF-AXM)

3.3.221 *Plenum.* A compartment or chamber to which one or more air ducts are connected and that forms part of the air-distribution system. (SAF-FIR)

3.3.222 *Point of Safety.* A location that (a) is exterior to and away from a building; or (b) is within a building of any construction type protected throughout by an approved automatic sprinkler system and that is either (1) within an exit enclosure meeting the requirements of this *Code*, or (2) within another portion of the building that is separated by smoke barriers in accordance with Section 8.5 having a minimum ½-hour fire resistance rating, and that portion of the building has access to a means of escape or exit that conforms to the requirements of this *Code* and does not necessitate return to the area of fire involvement; or (c) is within a building of Type I, Type II(222), Type II(111), Type III(211), Type IV, or Type V(111) construction (see 8.2.1.2) and is either (1) within an exit enclosure meeting the requirements of this *Code*, or (2) within another portion of the building that is separated by smoke barriers in accordance with Section 8.5 having a minimum ½-hour fire resistance rating, and that portion of the building has access to a means of escape or exit that conforms to the requirements of this *Code* and does not necessitate return to the area of fire involvement. (SAF-BCF)

3.3.223 *Previously Approved.* That which was acceptable to the authority having jurisdiction prior to the date this edition of the *Code* went into effect. (SAF-FUN)

3.3.224 *Power Doors.*

3.3.224.1* *Low-Energy Power-Operated Door.* Swinging, sliding, or folding door that opens automatically upon an action by a pedestrian, closes automatically, and operates with decreased forces and decreased speeds.

3.3.224.2* *Power-Assisted Door.* Swinging door that opens by reduced pushing or pulling force on the door operating hardware, closes automatically after the pushing or pulling force is released, and functions with decreased forces.

3.3.224.3 Power-Operated Door. Swinging, sliding, or folding door that opens automatically when approached by a pedestrian or opens automatically upon an action by a pedestrian, closes automatically, and includes provisions to prevent entrapment.

3.3.225 Private Party Tent. See 3.3.291.1. (SAF-AXM)

3.3.226 Professional Engineer. A person registered or licensed to practice engineering in a jurisdiction, subject to all laws and limitations imposed by the jurisdiction. (SAF-FUN)

3.3.227 Prompt Evacuation Capability. See 3.3.81.2. (SAF-BCF)

3.3.228* Proposed Design. A design developed by a design team and submitted to the authority having jurisdiction for approval. (SAF-FUN)

3.3.229 Proscenium Wall. See 3.3.302.2.

3.3.230* Public Way. A street, alley, or other similar parcel of land essentially open to the outside air deeded, dedicated, or otherwise permanently appropriated to the public for public use and having a clear width and height of not less than 10 ft (3050 mm). (SAF-MEA)

3.3.231* Ramp. A walking surface that has a slope steeper than 1 in 20. (SAF-MEA)

3.3.231.1 Aisle Ramp. A ramp within a seating area of an assembly occupancy that directly serves rows of seating to the side of the ramp. (SAF-AXM)

3.3.232 Ramp Type Parking Structure. See 3.3.284.8.5.

3.3.233 Rating.

3.3.233.1* Fire Protection Rating. The designation indicating the duration of the fire test exposure to which an opening protective assembly was exposed. [221, 2018] (SAF-FIR)

3.3.233.2 Fire Resistance Rating. The time, in minutes or hours, that materials or assemblies have withstood a fire exposure as determined by the tests, or methods based on tests, prescribed by this *Code*. (SAF-FIR)

3.3.234* Reconstruction. The reconfiguration of a space that affects an exit or a corridor shared by more than one occupant space; or the reconfiguration of a space such that the rehabilitation work area is not permitted to be occupied because existing means of egress and fire protection systems, or their equivalent, are not in place or continuously maintained. (SAF-FUN)

3.3.235 Reflective Insulation. See 3.3.160.2.

3.3.236 Registered Architect. A person licensed to practice architecture in a jurisdiction, subject to all laws and limitations imposed by the jurisdiction. (SAF-FUN)

3.3.237 Registered Design Professional (RDP). An individual who is registered or licensed to practice his/her respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed. (SAF-FUN)

3.3.238 Regular Stage. See 3.3.276.2.

3.3.239 Rehabilitation Work Area. See 3.3.22.8

3.3.240 Relocation. The movement of occupants to a safer area within the same building. (SAF-FUN)

3.3.241 Renovation. The replacement-in kind, strengthening, or upgrading of building elements, materials, equipment, or fixtures that does not result in a reconfiguration of the building spaces within.

3.3.242 Repair. The patching, restoration, or painting of materials, elements, equipment, or fixtures for the purpose of maintaining such materials, elements, equipment, or fixtures in good or sound condition. (SAF-FUN)

3.3.243 Residential Board and Care Occupancy. See 3.3.198.12.

3.3.244 Residential Board and Care Resident. A person who receives personal care and resides in a residential board and care facility. (SAF-BCF)

3.3.245 Residential Occupancy. See 3.3.198.13.

3.3.246 Safe Location. A location remote or separated from the effects of a fire so that such effects no longer pose a threat. (SAF-FUN)

3.3.247 Safety Factor. A factor applied to a predicted value to ensure that a sufficient safety margin is maintained. (SAF-FUN)

3.3.248 Safety Margin. The difference between a predicted value and the actual value where a fault condition is expected. (SAF-FUN)

3.3.249 Sally Port (Security Vestibule). A compartment provided with two or more doors where the intended purpose is to prevent continuous and unobstructed passage by allowing the release of only one door at a time. (SAF-DET)

3.3.250 Seating.

3.3.250.1* Festival Seating. A form of audience/spectator accommodation in which no seating, other than a floor or finished ground level, is provided for the audience/spectators gathered to observe a performance. (SAF-AXM)

3.3.250.2 Fixed Seating. Seating that is secured to the building structure. (SAF-AXM)

3.3.250.3 Folding and Telescopic Seating. A structure that is used for tiered seating of persons and whose overall shape and size can be reduced, without being dismantled, for purposes of moving or storing. (SAF-AXM)

3.3.250.4 Smoke-Protected Assembly Seating. Seating served by means of egress that is not subject to smoke accumulation within or under the structure. (SAF-AXM)

3.3.251 Self-Closing. Equipped with an approved device that ensures closing after opening. (SAF-MEA)

3.3.252* Self-Luminous. Illuminated by a self-contained power source and operated independently of external power sources. (SAF-MEA)

3.3.253 Self-Preservation Capability (Health Care and Ambulatory Health Care Occupancies). The ability of a patient to act on an innate desire to protect oneself from harm without staff intervention.

3.3.254* Self-Preservation (Day-Care Occupancy). The ability of a client to evacuate a day-care occupancy without direct intervention by a staff member. (SAF-END)

- 3.3.255 Sensitivity Analysis.** See 3.3.17.1.
- 3.3.256 Separate Atmosphere.** See 3.3.27.2.
- 3.3.257 Separated Occupancy.** See 3.3.198.14.
- 3.3.258 Severe Mobility Impairment.** The ability to move to stairs but without the ability to use the stairs. (SAF-MEA)
- 3.3.259 Single Station Alarm.** See 3.3.14.1.
- 3.3.260 Site-Fabricated Stretch System.** See 3.3.286.2.
- 3.3.261* Situation Awareness.** The perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future. (SAF-FUN)
- 3.3.262 Slow Evacuation Capability.** See 3.3.81.3.
- 3.3.263 Smoke Alarm.** See 3.3.14.2.
- 3.3.264 Smoke Barrier.** See 3.3.32.2.
- 3.3.265 Smoke Compartment.** See 3.3.49.2.
- 3.3.266 Smoke Detector.** A device that detects visible or invisible particles of combustion. [72, 2019] (SAF-BSF)
- 3.3.267 Smoke Developed Index.** See 3.3.157.2.
- 3.3.268* Smoke Partition.** A continuous membrane that is designed to form a barrier to limit the transfer of smoke. (SAF-FIR)
- 3.3.269* Smokeproof Enclosure.** An enclosure designed to limit the movement of products of combustion produced by a fire. (SAF-MEA)
- 3.3.270 Smoke-Protected Assembly Seating.** See 3.3.250.4.
- 3.3.271 Special Amusement Building.** See 3.3.37.9.
- 3.3.272 Special Inspection.** Services provided by a qualified person, retained by the owner and approved by the authority having jurisdiction, who observes the installation and witnesses the pretesting and operation of the system or systems. (SAF-BSF)
- 3.3.273 Special-Purpose Industrial Occupancy.** See 3.3.198.8.3.
- 3.3.274 Specification.**
- 3.3.274.1* Design Specification.** A building characteristic and other conditions that are under the control of the design team. (SAF-FUN)
- 3.3.274.2 Input Data Specification.** Information required by the verification method. (SAF-FUN)
- 3.3.275 Staff (Residential Board and Care).** Persons who provide personal care services, supervision, or assistance. (SAF-BCF)
- 3.3.276 Stage.** A space within a building used for entertainment and utilizing drops or scenery or other stage effects. (SAF-AXM)
- 3.3.276.1 Legitimate Stage.** A stage with a height greater than 50 ft (15 m) measured from the lowest point on the stage floor to the highest point of the roof or floor deck above. (SAF-AXM)
- 3.3.276.2 Regular Stage.** A stage with a height of 50 ft (15 m) or less measured from the lowest point on the stage floor to the highest point of the roof or floor deck above. (SAF-AXM)
- 3.3.277* Stair.**
- 3.3.277.1 Aisle Stair.** A stair within a seating area of an assembly occupancy that directly serves rows of seats to the side of the stair, including transition stairs that connect to an aisle or a landing. (SAF-AXM)
- 3.3.277.2 Outside Stair.** A stair with not less than one side open to the outer air. (SAF-MEA)
- 3.3.278 Stakeholder.** An individual, or representative of same, having an interest in the successful completion of a project. (SAF-FUN)
- 3.3.279 Storage Occupancy.** See 3.3.198.15.
- 3.3.280* Stories in Height.** The story count starting with the level of exit discharge and ending with the highest occupiable story containing the occupancy considered. (SAF-FUN)
- 3.3.281* Story.** The portion of a building located between the upper surface of a floor and the upper surface of the floor or roof next above. (SAF-FUN)
- 3.3.281.1 Occupiable Story.** A story occupied by people on a regular basis. (SAF-FUN)
- 3.3.282 Street.** A public thoroughfare that has been dedicated for vehicular use by the public and can be used for access by fire department vehicles. (SAF-MEA)
- 3.3.283* Street Floor.** A story or floor level accessible from the street or from outside the building at the finished ground level, with the floor level at the main entrance located not more than three risers above or below the finished ground level, and arranged and utilized to qualify as the main floor. (SAF-MER)
- 3.3.284* Structure.** That which is built or constructed. (SAF-FUN)
- 3.3.284.1 Air-Inflated Structure.** A structure whose shape is maintained by air pressure in cells or tubes forming all or part of the enclosure of the usable area and in which the occupants are not within the pressurized area used to support the structure. (SAF-IND)
- 3.3.284.2* Air-Supported Structure.** A structure where shape is maintained by air pressure and in which occupants are within the elevated pressure area. (SAF-IND)
- 3.3.284.3 Limited Access Structure.** A structure or portion of a structure lacking emergency openings. (SAF-IND)
- 3.3.284.4* Mall Structure.** A single structure enclosing a number of tenants and occupancies wherein two or more tenants or tenant buildings have a main entrance into one or more mall concourses. For the purpose of this *Code*, anchor buildings shall not be considered as a part of the mall structure. (SAF-MER)
- 3.3.284.5 Membrane Structure.** A building or portion of a building incorporating an air-inflated, air-supported, tensioned-membrane structure; a membrane roof; or a membrane-covered rigid frame to protect habitable or usable space. (SAF-IND)

3.3.284.6 Multilevel Play Structure. A structure that consists of tubes, slides, crawling areas, and jumping areas that is located within a building and is used for climbing and entertainment, generally by children. (SAF-AXM)

3.3.284.7* Open Structure. A structure that supports equipment and operations not enclosed within building walls. (SAF-IND)

3.3.284.8* Parking Structure. A building, structure, or portion thereof used for the parking, storage, or both, of motor vehicles. [88A, 2019] (SAF-IND)

△ **3.3.284.8.1 Parking Structure, Assisted Mechanical Type.** A parking structure that uses lifts or other mechanical devices to transport vehicles to the floors of a parking structure, where the vehicles are then parked by a person. [88A, 2019] (SAF-IND)

△ **3.3.284.8.2 Parking Structure, Automated Type.** A parking structure that uses computer controlled machines to store and retrieve vehicles, without drivers, in multi-level storage racks with no floors. [88A, 2019] (SAF-IND)

△ **3.3.284.8.3 Parking Structure, Enclosed.** Any parking structure that is not an open parking structure. [88A, 2019] (SAF-IND)

△ **3.3.284.8.4 Parking Structure, Open.** A parking structure that meets the requirements of 42.8.1.3. (SAF-IND)

△ **3.3.284.8.5 Parking Structure, Ramp Type.** A parking structure that utilizes sloped floors for vertical vehicle circulation. [88A, 2019] (SAF-IND)

3.3.284.9 Permanent Structure. A building or structure that is intended to remain in place for a period of more than 180 days in any consecutive 12-month period. (SAF-FUN)

3.3.284.10 Temporary Structure. A building or structure not meeting the definition of *permanent structure*. (See also 3.3.284.9, *Permanent Structure*.) (SAF-FUN)

3.3.284.11 Tensioned-Membrane Structure. A membrane structure incorporating a membrane and a structural support system such as arches, columns and cables, or beams wherein the stresses developed in the tensioned membrane interact with those in the structural support so that the entire assembly acts together to resist the applied loads. (SAF-IND)

3.3.284.12* Underground Structure. A structure or portions of a structure in which the floor level is located more than 30 ft (9.1 m) below the lowest level with an exit discharge. (SAF-IND)

3.3.284.13 Water-Surrounded Structure. A structure fully surrounded by water. (SAF-IND)

3.3.285 Suite.

3.3.285.1 Guest Suite. An accommodation with two or more contiguous rooms comprising a compartment, with or without doors between such rooms, that provides living, sleeping, sanitary, and storage facilities. (SAF-RES)

3.3.285.2 Health Care Suite (Health Care Occupancies). A room or rooms sharing a means of egress separated from the remainder of the building by walls, doors, floors, and ceilings. (SAF-HEA)

△ **3.3.285.3 Non-Patient-Care Suite (Health Care Occupancies).** A health care suite that is not intended for patient sleeping or care. (SAF-HEA)

3.3.285.4 Patient Care Non-Sleeping Suite (Health Care Occupancies). A health care suite providing care for one or more patients not intended for overnight patient sleeping. (SAF-HEA)

△ **3.3.285.5 Patient Care Sleeping Suite (Health Care Occupancies).** A health care suite containing one or more beds intended for overnight patient sleeping. (SAF-HEA)

3.3.286 System.

3.3.286.1 Elevator Evacuation System. A system, including a vertical series of elevator lobbies and associated elevator lobby doors, an elevator shaft(s), and a machine room(s), that provides protection from fire effects for elevator passengers, people waiting to use elevators, and elevator equipment so that elevators can be used safely for egress. (SAF-MEA)

3.3.286.2 Site-Fabricated Stretch System. A system, fabricated on-site, and intended for acoustical, tackable, or aesthetic purposes, that is comprised of three elements: (1) a frame (constructed of plastic, wood, metal, or other material) used to hold fabric in place, (2) a core material (infill, with the correct properties for the application), and (3) an outside layer, comprised of a textile, fabric, or vinyl, that is stretched taut and held in place by tension or mechanical fasteners via the frame. (SAF-INT)

3.3.287 Technically Infeasible. A change to a building that has little likelihood of being accomplished because the existing structural conditions require the removal or alteration of a load-bearing member that is an essential part of the structural frame, or because other existing physical or site constraints prohibit modification or addition of elements, spaces, or features that are in full and strict compliance with applicable requirements. (SAF-FUN)

3.3.288 Temporary Platform. See 3.3.220.1.

3.3.289 Temporary Structure. See 3.3.284.10.

3.3.290 Tensioned-Membrane Structure. See 3.3.284.11.

3.3.291* Tent. A temporary structure, the covering of which is made of pliable material that achieves its support by mechanical means such as beams, columns, poles, or arches, or by rope or cables, or both. (SAF-IND)

3.3.291.1 Private Party Tent. A tent erected in the yard of a private residence for entertainment, recreation, dining, a reception, or similar function. (SAF-AXM)

3.3.292 Thermal Barrier. See 3.3.32.3.

3.3.293 Tower. An enclosed independent structure or portion of a building with elevated levels for support of equipment or occupied for observation, control, operation, signaling, or similar limited use. (SAF-IND)

3.3.293.1 Airport Traffic Control Tower. An enclosed structure or building at airports with elevated levels for support of equipment and occupied for observation, control, operation, and signaling of aircraft in flight and on the ground. (SAF-IND)

3.3.294 Toxic Material. See 3.3.179.7.

3.3.295 Two-Family Dwelling Unit. See 3.3.68.3.

3.3.296 Uncertainty Analysis. See 3.3.17.2.

3.3.297 Underground Structure. See 3.3.284.12.

3.3.298 Verification Method. A procedure or process used to demonstrate or confirm that the proposed design meets the specified criteria. (SAF-FUN)

3.3.299* Vertical Opening. An opening through a floor or roof. (SAF-FIR)

3.3.300 Vision Panel. A glazing material installed in a fire door assembly to allow for viewing through the fire door assembly. [252, 2017] (SAF-FIR)

3.3.301 Vomitory. An entrance to a means of egress from an assembly seating area that pierces the seating rows. (SAF-AXM)

3.3.302 Wall.

3.3.302.1 Fire Barrier Wall. A wall, other than a fire wall, that has a fire resistance rating. (SAF-FIR)

3.3.302.2 Proscenium Wall. The wall that separates the stage from the auditorium or house. (SAF-AXM)

3.3.303* Wall or Ceiling Covering. A textile-, paper-, or polymeric-based product designed to be attached to a wall or ceiling surface for decorative or acoustical purposes. (SAF-INT)

3.3.304 Water-Surrounded Structure. See 3.3.284.13.

3.3.305 Weathered-Membrane Material. See 3.3.179.8.

3.3.306 Yard. An open, unoccupied space other than a court, unobstructed from the finished ground level to the sky on the lot on which a building is situated. (SAF-MEA)

Chapter 4 General

4.1* Goals.

4.1.1* Fire. A goal of this *Code* is to provide an environment for the occupants that is reasonably safe from fire by the following means:

- (1)* Protection of occupants not intimate with the initial fire development
- (2) Improvement of the survivability of occupants intimate with the initial fire development

4.1.2* Comparable Emergencies. An additional goal is to provide life safety during emergencies that can be mitigated using methods comparable to those used in case of fire.

4.1.3* Hazardous Materials Emergencies. An additional goal is to provide reasonable life safety during emergency events involving hazardous materials regulated by NFPA 30, NFPA 45, NFPA 54, NFPA 55, NFPA 58, *NFPA 72*, NFPA 400, and NFPA 495.

4.1.4* Crowd Movement. An additional goal is to provide for reasonably safe emergency crowd movement and, where required, reasonably safe nonemergency crowd movement.

4.2 Objectives.

4.2.1 Occupant Protection. A structure shall be designed, constructed, and maintained to protect occupants who are not

intimate with the initial fire development for the time needed to evacuate, relocate, or defend in place.

4.2.2 Structural Integrity. Structural integrity shall be maintained for the time needed to evacuate, relocate, or defend in place occupants who are not intimate with the initial fire development.

4.2.3* Hazardous Materials Emergencies Protection. Fundamental safeguards shall be provided to reasonably prevent or mitigate events involving hazardous materials as addressed in 4.1.3 to allow the time needed to evacuate, relocate, or defend in place occupants who are not intimate with the initial emergency incident.

4.2.4* Security Features. Where buildings are designed and constructed to include security features to protect occupants or contents, such features shall not compromise compliance with other requirements of this *Code*.

4.2.5 Systems Effectiveness. Systems utilized to achieve the goals of Section 4.1 shall be effective in mitigating the hazard or condition for which they are being used, shall be reliable, shall be maintained to the level at which they were designed to operate, and shall remain operational.

4.3* Assumptions.

4.3.1* General. The protection methods of this *Code* are based on the hazards associated with fire and other events that have comparable impact on a building and its occupants.

4.3.2 Single Fire Source. The fire protection methods of this *Code* assume a single fire source.

4.4 Life Safety Compliance Options.

4.4.1 Options. Life safety meeting the goals and objectives of Sections 4.1 and 4.2 shall be provided in accordance with either of the following:

- (1) Prescriptive-based provisions per 4.4.2
- (2) Performance-based provisions per 4.4.3

4.4.2 Prescriptive-Based Option.

4.4.2.1 A prescriptive-based life safety design shall be in accordance with Chapters 1 through 4, Chapters 6 through 11, Chapter 43, and the applicable occupancy chapter, Chapters 12 through 42.

4.4.2.2 Prescriptive-based designs meeting the requirements of Chapters 1 through 3, Sections 4.5 through 4.8, and Chapters 6 through 43 of this *Code* shall be deemed to satisfy the provisions of Sections 4.1 and 4.2.

4.4.2.3 Where a requirement of this *Code* conflicts with another requirement of this *Code*, the following shall apply:

- (1)* Where a specific requirement contained in Chapters 11 through 43 conflicts with a general requirement contained in Chapters 1 through 4 and Chapters 6 through 10, the requirement of Chapters 11 through 43 shall govern.
- (2)* Where a requirement contained in Chapters 1 through 4 and Chapters 6 through 10 conflicts with another requirement contained in Chapters 1 through 4 and Chapters 6 through 10, the more specific requirement shall govern.

(3)* Where a requirement contained in Chapters 11 through 43 conflicts with another requirement contained in Chapters 11 through 43, the more specific requirement shall govern.

4.4.3 Performance-Based Option. A performance-based life safety design shall be in accordance with Chapters 1 through 5.

4.5 Fundamental Requirements.

4.5.1 Multiple Safeguards. The design of every building or structure intended for human occupancy shall be such that reliance for safety to life does not depend solely on any single safeguard. An additional safeguard(s) shall be provided for life safety in case any single safeguard is rendered ineffective.

4.5.2 Appropriateness of Safeguards. Every building or structure shall be provided with means of egress and other fire and life safety safeguards of the kinds, numbers, locations, and capacities appropriate to the individual building or structure, with due regard to the following:

- (1) Character of the occupancy, including fire load
- (2) Capabilities of the occupants
- (3) Number of persons exposed
- (4) Fire protection available
- (5) Capabilities of response personnel
- (6) Height and construction type of the building or structure
- (7) Other factors necessary to provide occupants with a reasonable degree of safety

4.5.3 Means of Egress.

4.5.3.1 Number of Means of Egress. Two means of egress, as a minimum, shall be provided in every building or structure, section, and area where size, occupancy, and arrangement endanger occupants attempting to use a single means of egress that is blocked by fire or smoke. The two means of egress shall be arranged to minimize the possibility that both might be rendered impassable by the same emergency condition.

4.5.3.2 Unobstructed Egress. In every occupied building or structure, means of egress from all parts of the building shall be maintained free and unobstructed. Means of egress shall be accessible to the extent necessary to ensure reasonable safety for occupants having impaired mobility.

4.5.3.3 Awareness of Egress System. Every exit shall be clearly visible, or the route to reach every exit shall be conspicuously indicated. Each means of egress, in its entirety, shall be arranged or marked so that the way to a place of safety is indicated in a clear manner.

4.5.3.4 Lighting. Where artificial illumination is needed in a building or structure, egress facilities shall be included in the lighting design.

4.5.4* Occupant Notification. In every building or structure of such size, arrangement, or occupancy that a fire itself might not provide adequate occupant warning, fire alarm systems shall be provided where necessary to warn occupants of the existence of fire.

4.5.5* Situation Awareness. Systems used to achieve the goals of Section 4.1 shall be effective in facilitating and enhancing situation awareness, as appropriate, by building management, other occupants and emergency responders of the functionality or state of critical building systems, the conditions that might warrant emergency response, and the appropriate nature and timing of such responses.

4.5.6 Vertical Openings. Every vertical opening between the floors of a building shall be suitably enclosed or protected, as necessary, to afford reasonable safety to occupants while using the means of egress and to prevent the spread of fire, smoke, or fumes through vertical openings from floor to floor before occupants have entered exits.

4.5.7 System Design/Installation. Any fire protection system, building service equipment, feature of protection, or safeguard provided to achieve the goals of this *Code* shall be designed, installed, and approved in accordance with applicable NFPA standards.

4.5.8 Maintenance. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this *Code*, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be maintained, unless the *Code* exempts such maintenance.

4.6 General Requirements.

4.6.1 Authority Having Jurisdiction.

4.6.1.1 The authority having jurisdiction shall determine whether the provisions of this *Code* are met.

4.6.1.2 Any requirements that are essential for the safety of building occupants and that are not specifically provided for by this *Code* shall be determined by the authority having jurisdiction.

4.6.1.3 Where it is evident that a reasonable degree of safety is provided, any requirement shall be permitted to be modified if, in the judgment of the authority having jurisdiction, its application would be hazardous under normal occupancy conditions.

4.6.1.4 Technical Assistance.

4.6.1.4.1 The authority having jurisdiction shall be permitted to require a review by an approved independent third party with expertise in the matter to be reviewed at the submitter's expense. [1:1.15.1]

4.6.1.4.2 The independent reviewer shall provide an evaluation and recommend necessary changes of the proposed design, operation, process, or new technology to the authority having jurisdiction. [1:1.15.2]

4.6.1.4.3 The authority having jurisdiction shall be authorized to require design submittals to bear the stamp of a registered design professional. [1:1.15.3]

4.6.2 Previously Approved Features. Where another provision of this *Code* exempts a previously approved feature from a requirement, the exemption shall be permitted, even where the following conditions exist:

- (1) The area is being modernized, renovated, or otherwise altered.
- (2) A change of occupancy has occurred, provided that the feature's continued use is approved by the authority having jurisdiction.

4.6.3 Stories in Height. Unless otherwise specified in another provision of this *Code*, the stories in height of a building shall be determined as follows:

- (1) The stories in height shall be counted starting with the level of exit discharge and ending with the highest occupiable story containing the occupancy considered.
- (2) Stories below the level of exit discharge shall not be counted as stories.
- (3) Interstitial spaces used solely for building or process systems directly related to the level above or below shall not be considered a separate story.
- (4) A mezzanine shall not be counted as a story for the purpose of determining the allowable stories in height.
- (5) For purposes of application of the requirements for occupancies other than assembly, health care, detention and correctional, and ambulatory health care, where a maximum one-story abovegrade parking structure, enclosed, open, or a combination thereof, of Type I or Type II (222) construction or open Type IV construction, with grade entrance, is provided under a building, the number of stories shall be permitted to be measured from the floor above such a parking area.

4.6.4 Historic Buildings.

4.6.4.1 Rehabilitation projects in historic buildings shall comply with Chapter 43.

4.6.4.2* The provisions of this *Code* shall be permitted to be modified by the authority having jurisdiction for buildings or structures identified and classified as historic buildings or structures where it is evident that a reasonable degree of safety is provided.

4.6.5* Modification of Requirements for Existing Buildings. Where it is evident that a reasonable degree of safety is provided, the requirements for existing buildings shall be permitted to be modified if their application would be impractical in the judgment of the authority having jurisdiction.

4.6.6* Time Allowed for Compliance. A limited but reasonable time, commensurate with the magnitude of expenditure, disruption of services, and degree of hazard, shall be allowed for compliance with any part of this *Code* for existing buildings.

4.6.7 Building Rehabilitation.

4.6.7.1 Rehabilitation work on existing buildings shall be classified as one of the following work categories in accordance with 43.2.2.1:

- (1) Repair
- (2) Renovation
- (3) Modification
- (4) Reconstruction
- (5) Change of use or occupancy classification
- (6) Addition

4.6.7.2 Rehabilitation work on existing buildings shall comply with Chapter 43.

4.6.7.3 Except where another provision of this *Code* exempts a previously approved feature from a requirement, the resulting feature shall be not less than that required for existing buildings.

4.6.7.4* Existing life safety features that exceed the requirements for new buildings shall be permitted to be decreased to those required for new buildings.

4.6.7.5* Existing life safety features that do not meet the requirements for new buildings, but that exceed the requirements for existing buildings, shall not be further diminished.

4.6.8 Provisions in Excess of Code Requirements. Nothing in this *Code* shall be construed to prohibit a better building construction type, an additional means of egress, or an otherwise safer condition than that specified by the minimum requirements of this *Code*.

4.6.9 Conditions for Occupancy.

4.6.9.1 No new construction or existing building shall be occupied in whole or in part in violation of the provisions of this *Code*, unless the following conditions exist:

- (1) A plan of correction has been approved.
- (2) The occupancy classification remains the same.
- (3) No serious life safety hazard exists as judged by the authority having jurisdiction.

4.6.9.2 Where compliance with this *Code* is effected by means of a performance-based design, the owner shall annually certify compliance with the conditions and limitations of the design by submitting a warrant of fitness acceptable to the authority having jurisdiction. The warrant of fitness shall attest that the building features, systems, and use have been inspected and confirmed to remain consistent with design specifications outlined in the documentation required by Section 5.8 and that such features, systems, and use continue to satisfy the goals and objectives specified in Sections 4.1 and 4.2. (*See Chapter 5.*)

4.6.10 Construction, Repair, and Improvement Operations.

4.6.10.1* Buildings, or portions of buildings, shall be permitted to be occupied during construction, repair, alterations, or additions only where required means of egress and required fire protection features are in place and continuously maintained for the portion occupied or where alternative life safety measures acceptable to the authority having jurisdiction are in place.

4.6.10.2 Where required by Chapters 11 through 43, construction, alteration, and demolition operations shall comply with NFPA 241.

4.6.10.3* In buildings under construction, adequate escape facilities shall be maintained at all times for the use of construction workers. Escape facilities shall consist of doors, walkways, stairs, ramps, fire escapes, ladders, or other approved means or devices arranged in accordance with the general principles of the *Code* insofar as they can reasonably be applied to buildings under construction.

4.6.10.4 Flammable or explosive substances or equipment for repairs or alterations shall be permitted in a building while the building is occupied if the condition of use and safeguards provided do not create any additional danger or impediment to egress beyond the normally permissible conditions in the building.

4.6.11 Change of Use or Occupancy Classification. In any building or structure, whether or not a physical alteration is needed, a change from one use or occupancy classification to another shall comply with 4.6.7.

4.6.12 Maintenance, Inspection, and Testing.

4.6.12.1 Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature is required for compliance with the provisions of this *Code*, such device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or other feature shall thereafter be

continuously maintained. Maintenance shall be provided in accordance with applicable NFPA requirements or requirements developed as part of a performance-based design, or as directed by the authority having jurisdiction.

4.6.12.2 No existing life safety feature shall be removed or reduced where such feature is a requirement for new construction.

4.6.12.3* Existing life safety features obvious to the public, if not required by the *Code*, shall be either maintained or removed.

N 4.6.12.4* Where a door or door frame is not required to be fire protection rated and is equipped with a fire protection listing label, the door and the door frame shall not be required to comply with NFPA 80.

4.6.12.5 Any device, equipment, system, condition, arrangement, level of protection, fire-resistive construction, or any other feature requiring periodic testing, inspection, or operation to ensure its maintenance shall be tested, inspected, or operated as specified elsewhere in this *Code* or as directed by the authority having jurisdiction.

4.6.12.6 Maintenance, inspection, and testing shall be performed under the supervision of a responsible person who shall ensure that testing, inspection, and maintenance are made at specified intervals in accordance with applicable NFPA standards or as directed by the authority having jurisdiction.

N 4.6.12.7 Maintenance, inspection, and testing records shall be documented using approved reports or forms and shall be permitted to be submitted, stored, accessed, and shared electronically in an approved format.

4.6.13* Noncombustible Material.

4.6.13.1 A material that complies with any of the following shall be considered a noncombustible material:

- (1)* A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat
- (2) A material that is reported as passing ASTM E136, *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*
- (3) A material that is reported as complying with the pass/fail criteria of ASTM E136 when tested in accordance with the test method and procedure in ASTM E2652, *Standard Test Method for Assessing Combustibility of Materials Using a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*

4.6.13.2 Where the term *limited-combustible* is used in this *Code*, it shall also include the term *noncombustible*.

4.6.14* Limited-Combustible Material. A material shall be considered a limited-combustible material where **both** of the following **are** met:

- (1) The material **does not** comply with the requirements for a noncombustible material in accordance with 4.6.13.
- (2) The material, in the form in which it is used, exhibits a potential heat value not exceeding 3500 Btu/lb (8141 kJ/kg) when tested in accordance with NFPA 259. **[5000:7.1.4.2]**

Δ 4.6.14.1 The material shall have the structural base of a noncombustible material with a surfacing not exceeding a

thickness of 1/8 in. (3.2 mm) where the surfacing exhibits a flame spread index not greater than 50 when tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or UL 723, *Test for Surface Burning Characteristics of Building Materials*. **[5000:7.1.4.2.1]**

Δ 4.6.14.2 The material shall be composed of materials that, in the form and thickness used, neither exhibit a flame spread index greater than 25 nor evidence of continued progressive combustion when tested in accordance with ASTM E84 or UL 723 and **are** of such composition that all surfaces that would be exposed by cutting through the material on any plane would neither exhibit a flame spread index greater than 25 nor exhibit evidence of continued progressive combustion when tested in accordance with ASTM E84 or UL 723. **[5000:7.1.4.2.2]**

Δ 4.6.14.3 Materials shall be considered limited-combustible materials where tested in accordance with ASTM E2965, *Standard Test Method for Determination of Low Levels of Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter*, at an incident heat flux of 75 kW/m² for a 20-minute exposure and both the following conditions are met:

- (1) The peak heat release rate shall not exceed 150 kW/m² for longer than 10 seconds.
- (2) The total heat released shall not exceed 8 MJ/m². **[5000:7.1.4.2.3]**

4.6.14.4 Where the term *limited-combustible* is used in this *Code*, it shall also include the term *noncombustible*. **[5000:7.1.4.2.4]**

4.6.15 Fire-Retardant-Treated Wood. Fire-retardant-treated wood shall be a wood product impregnated with chemical by a pressure process or impregnated with chemical by other means during manufacture meeting the requirements in 4.6.15.1 through 4.6.15.5. **[703:4.1.1]**

Δ 4.6.15.1 Fire-retardant-treated wood shall be tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, or UL 723, *Test for Surface Burning Characteristics of Building Materials*. **[703:4.1.1.1]**

4.6.15.2 Fire-retardant-treated wood shall have a listed flame spread index of 25 or less. **[703:4.1.1.2]**

4.6.15.3 Fire-retardant-treated wood shall not show evidence of significant progressive combustion when the test is continued for an additional 20-minute period. **[703:4.1.1.3]**

4.6.15.4 The flame front shall not progress more than 10.5 ft (3.2 m) beyond the centerline of the burners at any time during the test. **[703:4.1.1.4]**

4.6.15.5 Wood structural panels shall be permitted to test only the front and back faces. **[703:4.1.1.6]**

4.6.16 Fire-Retardant-Treated Wood Treatment.

4.6.16.1 Pressure Process. For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under gauge pressures not less than 50 psi (345 kPa). The treatment shall provide permanent protection to all surfaces of the wood product. **[703:4.1.2.1]**

4.6.16.2 Other Means During Manufacture. For wood products impregnated with chemicals by other means during manufacture, the treatment shall be an integral part of the manufacturing process of the wood product. The treatment

shall provide permanent protection to all surfaces of the wood product. [703:4.1.2.2]

4.6.16.3 Wood Structural Panels. Adjustment to design values for wood structural panels shall be in accordance with the following:

- (1) The effect of the treatment, the method of redrying after treatment, and the exposure to high temperatures and high humidities on the flexure properties of fire-retardant-treated softwood plywood shall be determined in accordance with ASTM D5516, *Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant-Treated Softwood Plywood Exposed to Elevated Temperatures*.
- (2) The test data developed by ASTM D5516 shall be used to develop adjustment factors or maximum loads and spans, or both, for untreated plywood design values in accordance with ASTM D6305, *Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing*.
- (3) Each manufacturer shall publish the allowable maximum loads and spans for service as floor and roof sheathing for their treatment. [5000:45.5.16.3]

4.6.16.4 Lumber. Adjustment to design values for lumber shall be in accordance with the following:

- (1) For each species of wood treated, the effect of the treatment, the method of redrying after treatment, and the exposure to high temperatures and high humidities on the allowable design properties of fire-retardant-treated lumber shall be determined in accordance with ASTM D5664, *Standard Test Method for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant-Treated Lumber*.
- (2) The test data developed by ASTM D5664 shall be used to develop modification factors for use at or near room temperature and at elevated temperatures and humidity in accordance with ASTM D6841, *Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber*.
- (3) Each manufacturer shall publish the modification factors for service at ambient temperatures of up to 100°F (37.8°C) and for service as roof framing.
- (4) The roof framing modification factors shall take into consideration the climatological location. [5000:45.5.16.4]

4.6.16.5 Exposure to Weather or Damp or Wet Locations. Where fire-retardant-treated wood is exposed to weather or damp or wet locations, it shall be identified as “exterior” to indicate that there is no increase in the listed flame spread index when subjected to ASTM D2898, *Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing*. [5000:45.5.16.5]

4.6.16.6 Interior Applications. Interior fire-retardant-treated wood shall have a moisture content of not over 28 percent when tested in accordance with the procedures of ASTM D3201/D3201M, *Standard Test Method for Hygroscopic Properties of Fire-Retardant-Wood and Wood-Based Products*, at 92 percent relative humidity. Interior fire-retardant-treated wood shall be tested in accordance with 4.6.16.3 or 4.6.16.4. [5000:45.5.16.7]

4.6.16.7 Moisture Content. Fire-retardant-treated wood shall have a moisture content of 19 percent or less for lumber and 15 percent or less for wood structural panels before use. For wood kiln dried after treatment (KDAT), the kiln temperatures

shall not exceed the temperatures used in drying the lumber and plywood submitted for the testing described in 4.6.16.3 or 4.6.16.4. [5000:45.5.16.8]

4.6.17 Grade Plane. The grade plane shall be established by calculating the average of the finished ground level adjoining the building at all exterior walls. Where the finished ground level slopes down from the exterior walls, the grade plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 ft (1.8 m) from the building, between the building and a point 6 ft (1.8 m) from the building.

4.7* Fire Drills.

4.7.1 Where Required. Emergency egress and relocation drills conforming to the provisions of this *Code* shall be conducted as specified by the provisions of Chapters 11 through 43, or by appropriate action of the authority having jurisdiction. Drills shall be designed in cooperation with the local authorities.

4.7.2* Drill Frequency. Emergency egress and relocation drills, where required by Chapters 11 through 43 or the authority having jurisdiction, shall be held with sufficient frequency to familiarize occupants with the drill procedure and to establish conduct of the drill as a matter of routine. Drills shall include suitable procedures to ensure that all persons subject to the drill participate.

4.7.3 Orderly Evacuation. When conducting drills, emphasis shall be placed on orderly evacuation rather than on speed.

4.7.4* Simulated Conditions. Drills shall be held at expected and unexpected times and under varying conditions to simulate the unusual conditions that can occur in an actual emergency.

4.7.5 Relocation Area. Drill participants shall relocate to a predetermined location and remain at such location until a recall or dismissal signal is given.

4.7.6* A written record of each drill shall be completed by the person responsible for conducting the drill and maintained in an approved manner.

4.8 Emergency Action Plan.

4.8.1 Where Required. Emergency action plans shall be provided as follows:

- (1) Where required by the provisions of Chapters 11 through 42
- (2) Where required by action of the authority having jurisdiction

4.8.2 Plan Requirements.

4.8.2.1* Emergency action plans shall include the following:

- (1) Procedures for reporting of emergencies
- (2) Occupant and staff response to emergencies
- (3)* Evacuation, relocation, and shelter-in-place procedures appropriate to the building, its occupancy, emergencies, and hazards
- (4) Appropriateness of the use of elevators
- (5) Design and conduct of fire drills
- (6) Type and coverage of building fire protection systems
- (7) Other items required by the authority having jurisdiction

4.8.2.2 Required emergency action plans shall be submitted to the authority having jurisdiction for review.

4.8.2.3* Emergency action plans shall be reviewed and updated as required by the authority having jurisdiction.

Chapter 5 Performance-Based Option

5.1 General Requirements.

5.1.1* Application. The requirements of this chapter shall apply to life safety systems designed to the performance-based option permitted by 4.4.1 and 4.4.3.

5.1.2 Goals and Objectives. The performance-based design shall meet the goals and objectives of this *Code* in accordance with Sections 4.1 and 4.2.

5.1.3 Qualifications. The performance-based design shall be prepared by a registered design professional.

5.1.4* Independent Review. The authority having jurisdiction shall be permitted to require an approved, independent third party to review the proposed design and provide an evaluation of the design to the authority having jurisdiction.

5.1.5 Sources of Data. Data sources shall be identified and documented for each input data requirement that must be met using a source other than a design fire scenario, an assumption, or a building design specification. The degree of conservatism reflected in such data shall be specified, and a justification for the source shall be provided.

5.1.6* Final Determination. The authority having jurisdiction shall make the final determination as to whether the performance objectives have been met.

5.1.7* Maintenance of Design Features. The design features required for the building to continue to meet the performance goals and objectives of this *Code* shall be maintained for the life of the building. Such performance goals and objectives shall include complying with all documented assumptions and design specifications. Any variations shall require the approval of the authority having jurisdiction prior to the actual change. (See also 4.6.9.2.)

5.1.8 Definitions.

5.1.8.1 General. For definitions, see Chapter 3, Definitions.

5.1.8.2 Special Definitions. A list of special terms used in this chapter follows:

- (1) **Alternative Calculation Procedure.** See 3.3.15.
- (2) **Data Conversion.** See 3.3.53.
- (3) **Design Fire Scenario.** See 3.3.107.1.
- (4) **Design Specification.** See 3.3.274.1.
- (5) **Design Team.** See 3.3.60.
- (6) **Exposure Fire.** See 3.3.91.
- (7) **Fire Model.** See 3.3.104.
- (8) **Fire Scenario.** See 3.3.107.
- (9) **Fuel Load.** See 3.3.172.1.
- (10) **Incapacitation.** See 3.3.156.
- (11) **Input Data Specification.** See 3.3.274.2.
- (12) **Occupant Characteristics.** See 3.3.199.
- (13) **Performance Criteria.** See 3.3.214.
- (14) **Proposed Design.** See 3.3.228.
- (15) **Safe Location.** See 3.3.246.
- (16) **Safety Factor.** See 3.3.247.
- (17) **Safety Margin.** See 3.3.248.
- (18) **Sensitivity Analysis.** See 3.3.17.1.
- (19) **Stakeholder.** See 3.3.278.

(20) **Uncertainty Analysis.** See 3.3.17.2.

(21) **Verification Method.** See 3.3.298.

5.2 Performance Criteria.

5.2.1 General. A design shall meet the objectives specified in Section 4.2 if, for each design fire scenario, assumption, and design specification, the performance criterion in 5.2.2 is met.

5.2.2* Performance Criterion. Any occupant who is not intimate with ignition shall not be exposed to instantaneous or cumulative untenable conditions.

5.3 Retained Prescriptive Requirements.

5.3.1* Systems and Features. All fire protection systems and features of the building shall comply with applicable NFPA standards for those systems and features.

5.3.2 Means of Egress. The design shall comply with the following requirements in addition to the performance criteria of Section 5.2 and the methods of Sections 5.4 through 5.8:

- (1) Changes in level in means of egress — 7.1.7
- (2) Guards — 7.1.8
- (3) Doors — 7.2.1
- (4) Stairs — 7.2.2, excluding the provisions of 7.2.2.5.1, 7.2.2.5.2, 7.2.2.6.2, 7.2.2.6.3, and 7.2.2.6.4
- (5) Ramps — 7.2.5, excluding the provisions of 7.2.5.4.1, 7.2.5.5, and 7.2.5.7.1
- (6) Fire escape ladders — 7.2.9
- (7) Alternating tread devices — 7.2.11
- (8) Capacity of means of egress — Section 7.3, excluding the provisions of 7.3.3 and 7.3.4
- (9) Impediments to egress — 7.5.2
- (10) Illumination of means of egress — Section 7.8
- (11) Emergency lighting — Section 7.9
- (12) Marking of means of egress — Section 7.10

5.3.3 Equivalency. Equivalent designs for the features covered in the retained prescriptive requirements mandated by 5.3.2 shall be addressed in accordance with the equivalency provisions of Section 1.4.

5.4 Design Specifications and Other Conditions.

5.4.1* Clear Statement. Design specifications and other conditions used in the performance-based design shall be clearly stated and shown to be realistic and sustainable.

5.4.2 Assumptions and Design Specifications Data.

5.4.2.1 Each assumption and design specification used in the design shall be accurately translated into input data specifications, as appropriate for the method or model.

5.4.2.2 Any assumption and design specifications that the design analyses do not explicitly address or incorporate and that are, therefore, omitted from input data specifications shall be identified, and a sensitivity analysis of the consequences of that omission shall be performed.

5.4.2.3 Any assumption and design specifications modified in the input data specifications, because of limitations in test methods or other data-generation procedures, shall be identified, and a sensitivity analysis of the consequences of the modification shall be performed.

5.4.3 Building Characteristics. Characteristics of the building or its contents, equipment, or operations that are not inherent in the design specifications, but that affect occupant behavior

or the rate of hazard development, shall be explicitly identified.

5.4.4* Operational Status and Effectiveness of Building Features and Systems. The performance of fire protection systems, building features, and emergency procedures shall reflect the documented performance and reliability of the components of those systems or features, unless design specifications are incorporated to modify the expected performance.

5.4.5 Occupant Characteristics.

5.4.5.1* General. The selection of occupant characteristics to be used in the design calculations shall be approved by the authority having jurisdiction and shall provide an accurate reflection of the expected population of building users. Occupant characteristics shall represent the normal occupant profile, unless design specifications are used to modify the expected occupant features. Occupant characteristics shall not vary across fire scenarios, except as authorized by the authority having jurisdiction.

5.4.5.2* Response Characteristics. The basic response characteristics of sensibility, reactivity, mobility, and susceptibility shall be evaluated. Such evaluation shall include the expected distribution of characteristics of a population appropriate to the use of the building. The source of data for these characteristics shall be documented.

5.4.5.3 Location. It shall be assumed that, in every normally occupied room or area, at least one person shall be located at the most remote point from the exits.

5.4.5.4* Number of Occupants. The design shall be based on the maximum number of people that every occupied room or area is expected to contain. Where the success or failure of the design is contingent on the number of occupants not exceeding a specified maximum, operational controls shall be used to ensure that the maximum number of occupants is not exceeded.

5.4.5.5* Staff Assistance. The inclusion of trained employees as part of the fire safety system shall be identified and documented.

5.4.6 Emergency Response Personnel. Design characteristics or other conditions related to the availability, speed of response, effectiveness, roles, and other characteristics of emergency response personnel shall be specified, estimated, or characterized sufficiently for evaluation of the design.

5.4.7* Post-Construction Conditions. Design characteristics or other conditions related to activities during the life of a building that affect the ability of the building to meet the stated goals and objectives shall be specified, estimated, or characterized sufficiently for evaluation of the design.

5.4.8 Off-Site Conditions. Design characteristics or other conditions related to resources or conditions outside the property being designed that affect the ability of the building to meet the stated goals and objectives shall be specified, estimated, or characterized sufficiently for evaluation of the design.

5.4.9* Consistency of Assumptions. The design shall not include mutually inconsistent assumptions, specifications, or statements of conditions.

5.4.10* Special Provisions. Additional provisions that are not covered by the design specifications, conditions, estimations,

and assumptions provided in Section 5.4, but that are required for the design to comply with the performance objectives, shall be documented.

5.5* Design Fire Scenarios.

5.5.1 Approval of Parameters. The authority having jurisdiction shall approve the parameters involved in design fire scenarios. The proposed design shall be considered to meet the goals and objectives if it achieves the performance criteria for each required design fire scenario. (See 5.5.3.)

5.5.2* Evaluation. Design fire scenarios shall be evaluated using a method acceptable to the authority having jurisdiction and appropriate for the conditions. Each design fire scenario shall be as challenging as any that could occur in the building, but shall be realistic, with respect to at least one of the following scenario specifications:

- (1) Initial fire location
- (2) Early rate of growth in fire severity
- (3) Smoke generation

5.5.3* Required Design Fire Scenarios. Design fire scenarios shall comply with the following:

- (1) Scenarios selected as design fire scenarios shall include, but shall not be limited to, those specified in 5.5.3.1 through 5.5.3.8.
- (2) Design fire scenarios demonstrated by the design team to the satisfaction of the authority having jurisdiction as inappropriate for the building use and conditions shall not be required to be evaluated fully.

5.5.3.1* Design Fire Scenario 1. Design Fire Scenario 1 shall be described as follows:

- (1) It is an occupancy-specific fire representative of a typical fire for the occupancy.
- (2) It explicitly accounts for the following:
 - (a) Occupant activities
 - (b) Number and location of occupants
 - (c) Room size
 - (d) Contents and furnishings
 - (e) Fuel properties and ignition sources
 - (f) Ventilation conditions
 - (g) Identification of the first item ignited and its location

5.5.3.2* Design Fire Scenario 2. Design Fire Scenario 2 shall be described as follows:

- (1) It is an ultrafast-developing fire, in the primary means of egress, with interior doors open at the start of the fire.
- (2) It addresses the concern regarding a reduction in the number of available means of egress.

5.5.3.3* Design Fire Scenario 3. Design Fire Scenario 3 shall be described as follows:

- (1) It is a fire that starts in a normally unoccupied room, potentially endangering a large number of occupants in a large room or other area.
- (2) It addresses the concern regarding a fire starting in a normally unoccupied room and migrating into the space that potentially holds the greatest number of occupants in the building.

5.5.3.4* Design Fire Scenario 4. Design Fire Scenario 4 shall be described as follows: